

**THE OFFICE OF REGULATORY STAFF
DIRECT TESTIMONY AND EXHIBITS
OF
DR. J. RANDALL WOOLRIDGE**



DOCKET NO. 2006-97-WS

**Application of Tega Cay Water Service,
Incorporated for Adjustment of Rates and
Charges and Modifications to Certain Terms and
Conditions for the Provision of Water and Sewer
Service**

Tega Cay Water Service, Inc.

Direct Testimony of Dr. J. Randall Woolridge

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LIST OF EXHIBIT

Exhibit

Title

JRW-1	Recommended Rate of Return
JRW-2	The Impact of the 2003 Tax Law on Required Returns
JRW-3	Summary Financial Statistics
JRW-4	Capital Structure Ratios and Debt Cost Rates
JRW-5	Public Utility Capital Cost Indicators
JRW-6	Industry Average Betas
JRW-7	DCF Study
JRW-8	CAPM Study
JRW-9	Value Line Projected Market Return
JRW-10	Historic Equity Risk Premium Evaluation

1 **Q. PLEASE STATE YOUR FULL NAME, ADDRESS, AND OCCUPATION.**

2 A. My name is J. Randall Woolridge and my business address is 120 Haymaker Circle, State
3 College, PA 16801. I am a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal
4 Endowed University Fellow in Business Administration at the University Park Campus of the
5 Pennsylvania State University. I am also the Director of the Smeal College Trading Room and
6 President of the Nittany Lion Fund, LLC. A summary of my educational background, research, and
7 related business experience is provided in Appendix A.

8 **I. SUBJECT OF TESTIMONY AND**

9 **SUMMARY OF RECOMMENDATIONS**

10
11 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

12 A. I have been asked by the Office of Regulatory Staff to provide an opinion as to the overall
13 fair rate of return or cost of capital for Tega Cay Water Service, Inc. ("Tega Cay" or "Company"). I
14 have also been asked to evaluate Tega Cay's rate of return testimony in this proceeding.

15 **Q. PLEASE REVIEW YOUR COST OF CAPITAL RETURN FINDINGS.**

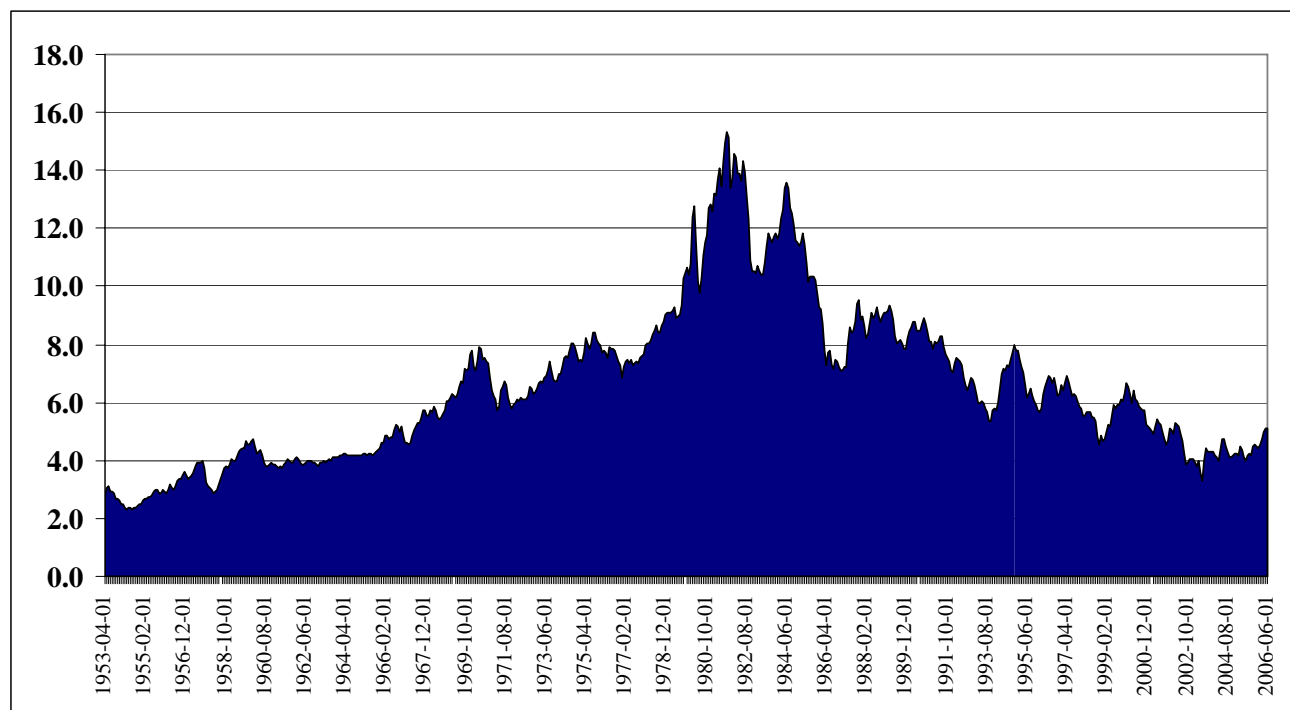
16 A. I have independently arrived at a cost of capital for the water utility services of Tega Cay. I
17 have established an equity cost rate in the range of 9.00%-9.40% for Tega Cay by applying the
18 Discounted Cash Flow ("DCF") and a Capital Asset Pricing Model ("CAPM") approaches to two
19 groups of water utility companies. Utilizing my equity cost rate, capital structure ratios, and senior
20 capital cost rates, I am recommending an overall fair rate of return in the range of 7.48% - 7.64% for
21 Tega Cay. This recommendation is summarized in Exhibit_(JRW-1).

1 **Q. PLEASE DISCUSS CAPITAL COSTS IN TODAY’S MARKETS.**

2 A. Capital cost rates for U.S. corporations are currently at their lowest levels in more than
3 four decades. Corporate capital cost rates are determined by the level of interest rates and the
4 risk premium demanded by investors to buy the debt and equity capital of corporate issuers. The
5 base level of interest rates in the US economy is indicated by the rates on ten-year U.S. Treasury
6 bonds. The rates are provided in the graph below from 1953 to the present. As indicated, prior
7 to the decline in rates that began in the year 2000, the 10-year Treasury had not been in the 4-5
8 percent range since the 1960s.

9 **Yields on Ten-Year Treasury Bonds**

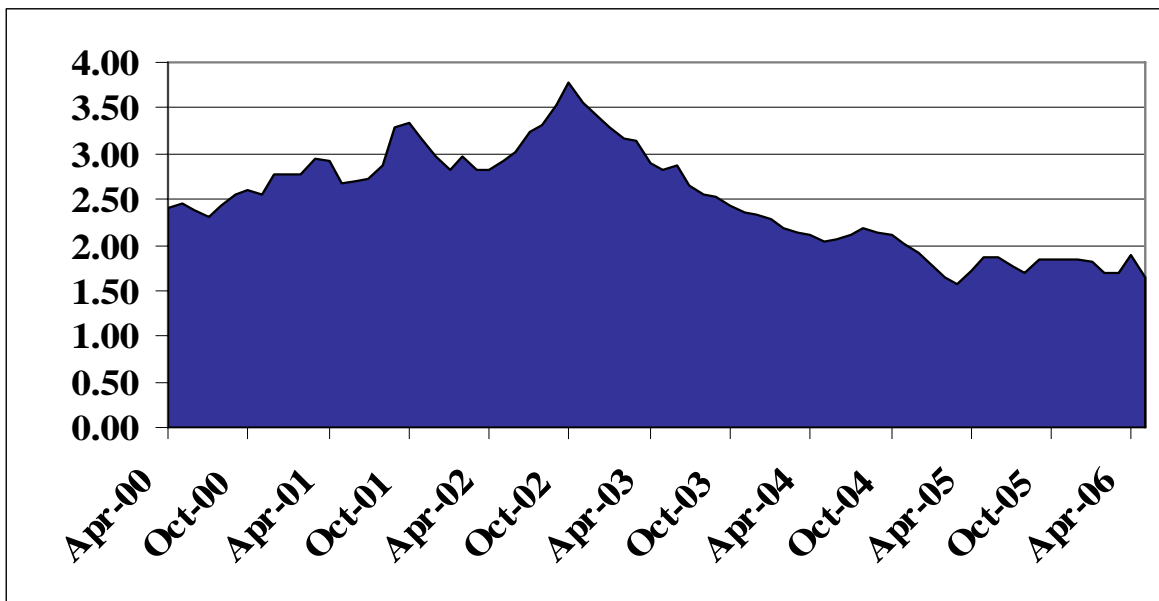
10 **1953-Present**



11 Source: <http://research.stlouisfed.org/fred2/data/GS10.txt>

The second base component of the corporate capital cost rates is the risk premium. The risk premium is the return premium required by investors to purchase riskier securities. Risk premiums for bonds are the yield differentials between different bond classes as rated by agencies such as Moody's, and Standard and Poor's. The graph below provides the yield differential between Baa-rate corporate bonds and 10-year Treasuries. This yield differential peaked at 350 basis points (BPs) in 2002 and has declined significantly since that time. This is an indication that the market price of risk has declined and therefore the risk premium has declined in recent years.

Corporate Bond Yield Spreads
Baa-Rated Corporate Bond Yield Minus Ten-Year Treasury Bond Yield



Source: <http://www.treas.gov/offices/domestic-finance/debt-management/interest-rate/index.html>

1 The equity risk premium is the return premium required to purchase stocks as
2 opposed to bonds. Since the equity risk premium is not readily observable in the markets (as
3 are bond risk premiums), and there are alternative approaches to estimating the equity
4 premium, it is the subject of much debate. One way to estimate the equity risk premium is to
5 compare the mean returns on bonds and stocks over long historical periods. Measured in
6 this manner, the equity risk premium has been in the 5-7 percent range. But recent studies
7 by leading academics indicate the forward-looking equity risk premium is in the 3-4 percent
8 range. These authors indicate that historical equity risk premiums are upwardly biased
9 measures of expected equity risk premiums. Jeremy Siegel, a Wharton finance professor and
10 author of the book *Stocks for the Long Term*, published a study entitled “The Shrinking
11 Equity Risk Premium.”¹ He concludes:

12 The degree of the equity risk premium calculated from data estimated
13 from 1926 is unlikely to persist in the future. The real return on
14 fixed-income assets is likely to be significantly higher than estimated
15 on earlier data. This is confirmed by the yields available on Treasury
16 index-linked securities, which currently exceed 4%. Furthermore,
17 despite the acceleration in earnings growth, the return on equities is
18 likely to fall from its historical level due to the very high level of
19 equity prices relative to fundamentals.
20

21 Even Alan Greenspan, the former Chairman of the Federal Reserve Board, indicated in an
22 October 14, 1999, speech on financial risk that the fact that equity risk premiums have
23 declined during the past decade is “not in dispute.” His assessment focused on the

¹ Jeremy J. Siegel, “The Shrinking Equity Risk Premium,” *The Journal of Portfolio Management* (Fall, 1999), p.15.

1 relationship between information availability and equity risk premiums.

2 There can be little doubt that the dramatic improvements in
3 information technology in recent years have altered our approach to
4 risk. Some analysts perceive that information technology has
5 permanently lowered equity premiums and, hence, permanently
6 raised the prices of the collateral that underlies all financial assets.

7
8 The reason, of course, is that information is critical to the
9 evaluation of risk. The less that is known about the current state of
10 a market or a venture, the less the ability to project future
11 outcomes and, hence, the more those potential outcomes will be
12 discounted.

13
14 The rise in the availability of real-time information has reduced the
15 uncertainties and thereby lowered the variances that we employ to
16 guide portfolio decisions. At least part of the observed fall in
17 equity premiums in our economy and others over the past five
18 years does not appear to be the result of ephemeral changes in
19 perceptions. It is presumably the result of a permanent technology-
20 driven increase in information availability, which by definition
21 reduces uncertainty and therefore risk premiums. This decline is
22 most evident in equity risk premiums. It is less clear in the
23 corporate bond market, where relative supplies of corporate and
24 Treasury bonds and other factors we cannot easily identify have
25 outweighed the effects of more readily available information about
26 borrowers.²

27
28 In sum, the relatively low interest rates in today's markets as well as the lower risk premiums
29 required by investors indicate that capital costs for U.S. companies are the lowest in decades. In
30 addition, the *Jobs and Growth Tax Relief Reconciliation Act of 2003* further lowered capital cost
31 rates for companies.

² Alan Greenspan, "Measuring Financial Risk in the Twenty-First Century," Office of the Comptroller of the Currency Conference, October 14, 1999.

1 **Q. HOW DID THE *JOBS AND GROWTH TAX RELIEF RECONCILIATION ACT* of**
2 ***2003* REDUCE THE COST OF CAPITAL FOR COMPANIES?**

3 A. On May 28th of 2003, President Bush signed the *Jobs and Growth Tax Relief Reconciliation*
4 *Act of 2003*. The primary purpose of this legislation was to reduce taxes to enhance economic
5 growth. A primary component of the new tax law was a significant reduction in the taxation of
6 corporate dividends for individuals. Dividends have been described as “double-taxed.” First,
7 corporations pay taxes on the income they earn before they pay dividends to investors, then
8 investors pay taxes on the dividends that they receive from corporations. One of the implications
9 of the double taxation of dividends is that, all else equal, it results in a higher cost of raising
10 capital for corporations. The tax legislation reduced the effect of double taxation of dividends by
11 lowering the tax rate on dividends from the 30 percent range (the average tax bracket for
12 individuals) to 15 percent.

13 Overall, the 2003 tax law reduced the pre-tax return requirements of investors, thereby
14 reducing corporations’ cost of equity capital. This is because the reduction in the taxation of
15 dividends for individuals enhances their after-tax returns and thereby reduces their pre-tax
16 required returns. This reduction in pre-tax required returns (due to the lower tax on dividends)
17 effectively reduces the cost of equity capital for companies. The 2003 tax law also reduced the
18 tax rate on long-term capital gains from 20% to 15%. My assessment indicates that the
19 magnitude of the reduction in corporate equity cost rates could be as large as 100 basis points

(See Exhibit_(JRW-2)).

II. COMPARISON GROUP SELECTION

Q. PLEASE DESCRIBE YOUR APPROACH TO DEVELOPING A FAIR RATE OF RETURN RECOMMENDATION FOR TEGA CAY.

A. To develop a fair rate of return recommendation for Tega Cay, I evaluated the return requirements of investors on the common stock of two groups of publicly-held water service companies.

Q. PLEASE DESCRIBE YOUR GROUPS OF WATER SERVICE COMPANIES.

A. The companies in the groups are listed as water utility companies in *AUS Utility Reports*.³ The ten water companies were classified as the Small Water Company Group (annual water revenues of less than \$100M) and the Large Water Company Group (annual water revenues of more than \$100M). The Small Water Company Group (SWC Group) includes Artesian Resources, Connecticut Water Service Co., Middlesex Water Company, Pennichuck Corporation, and the York Water Company. The Large Water Company Group (LWC Group) includes American States Water Company, Aqua America, Inc., California Water Service Co., and SJW Corporation. I have

1 excluded Southwest Water Co. from the analysis because it receives only 39% of its revenues from
2 water utility operations. I have also excluded Birmingham Utilities, Inc., because the company was
3 only recently added to the water companies covered by *AUS Utility Reports*.

4 Summary financial statistics for the two groups are provided on page 1 of Exhibit_(JRW-3).
5 On average, the SWC Group has average revenues and net plant of \$44.9M and \$195.4M,
6 respectively. The group has an average common equity ratio of 46.2%, and a current average earned
7 return on common equity of 9.3%. The primary service territories for the water companies in this
8 group are New Hampshire, Delaware, New Jersey, Connecticut, and Pennsylvania. The mean total
9 revenues and net plant for the LWC Group are \$313.5M and \$956.1M, respectively. This group's
10 average common equity ratio and earned return on common equity are 50.0% and 10.9%,
11 respectively. The primary service territory for three of the four companies in the LWC Group is
12 California.

14 III. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

16 **Q. WHAT CAPITAL STRUCTURE RATIOS AND SENIOR CAPITAL COST RATES**
17 **ARE YOU USING TO ESTIMATE AN OVERALL RATE OF RETURN FOR TEGA CAY?**

18 A. Exhibit_(JRW-4) provides an evaluation of Tega Cay's proposed capital structure and the
19 average capital structures of the companies in the LWC and SWC groups. The Company's proposed

³ AUS recently began coverage of BIW, Ltd., but there is insufficient data to include the company at this time.

capital structure includes 59.1% debt and 40.9% common equity. The average capitalization of the companies in the LWC and SWC groups is 53.27% debt and 46.73% common equity. Given the relative similarity proximity of the two capitalizations, I will adopt the Company's proposed capital structure. I will also use the Tega Cay's proposed debt cost rate of 6.42%. This is summarized below.

Tega Cay Water Service, Inc.
Proposed Capital Structure and Senior Capital Cost Rates

Source of Capital	Capitalization Ratio	Cost Rate
Long-Term Debt	59.1%	6.42%
Common Equity	40.9%	

IV. THE COST OF COMMON EQUITY CAPITAL

A. OVERVIEW

Q. WHY MUST AN OVERALL COST OF CAPITAL OR FAIR RATE OF RETURN BE ESTABLISHED FOR A PUBLIC UTILITY?

A. In a competitive industry, the return on a firm's common equity capital is determined through the competitive market for its goods and services. Due to the capital requirements needed to provide utility services, however, and to the economic benefit to society from avoiding duplication of these services, some public utilities are monopolies. It is not appropriate to permit monopoly utilities to set their own prices because of the lack of competition and the essential nature of the services they provide. Thus, regulation seeks to establish prices which are fair to consumers and at the same time

are sufficient to meet the operating and capital costs of the utility, i.e., provide an adequate return on capital to attract investors.

Q. PLEASE PROVIDE AN OVERVIEW OF THE COST OF CAPITAL IN THE CONTEXT OF THE THEORY OF THE FIRM.

A. The total cost of operating a business includes the cost of capital. The cost of common equity capital is the expected return on a firm's common stock that the marginal investor would deem sufficient to compensate for risk and the time value of money. In equilibrium, the expected and required rates of return on a company's common stock are equal.

Normative economic models of the firm, developed under very restrictive assumptions, provide insight into the relationship between firm performance or profitability, capital costs, and the value of the firm. Under the economist's ideal model of perfect competition, where entry and exit is costless, products are undifferentiated, and there are increasing marginal costs of production, firms produce up to the point where price equals marginal cost. Over time, a long-run equilibrium is established where price equals average cost, including the firm's capital costs. In equilibrium, total revenues equal total costs, and because capital costs represent investors' required return on the firm's capital, actual returns equal required returns and the market value and the book value of the firm's securities must be equal.

In the real world, firms can achieve competitive advantage due to product market imperfections. Most notably, companies can gain competitive advantage through product differentiation (adding real or perceived value to products) and by achieving economies of scale

(decreasing marginal costs of production). Competitive advantage allows firms to price products above average cost and thereby earn accounting profits greater than those required to cover capital costs. When these profits are in excess of that required by investors, or when a firm earns a return on equity in excess of its cost of equity, investors respond by valuing the firm's equity in excess of its book value.

James M. McTaggart, founder of the international management consulting firm Marakon Associates, has described this essential relationship between the return on equity, the cost of equity, and the market-to-book ratio in the following manner:⁴

Fundamentally, the value of a company is determined by the cash flow it generates over time for its owners, and the minimum acceptable rate of return required by capital investors. This "cost of equity capital" is used to discount the expected equity cash flow, converting it to a present value. The cash flow is, in turn, produced by the interaction of a company's return on equity and the annual rate of equity growth. High return on equity (ROE) companies in low-growth markets, such as Kellogg, are prodigious generators of cash flow, while low ROE companies in high-growth markets, such as Texas Instruments, barely generate enough cash flow to finance growth.

A company's ROE over time, relative to its cost of equity, also determines whether it is worth more or less than its book value. If its ROE is consistently greater than the cost of equity capital (the investor's minimum acceptable return), the business is economically profitable and its market value will exceed book value.

If, however, the business earns an ROE consistently less than its cost of equity, it is economically unprofitable and its market value will be less than book value.

As such, the relationship between a firm's return on equity, cost of equity, and market-to-book ratio is relatively straightforward. A firm which earns a return on equity above its cost of equity will see

⁴ James M. McTaggart, "The Ultimate Poison Pill: Closing the Value Gap," *Commentary* (Spring 1988), p. 2.

its common stock sell at a price above its book value. Conversely, a firm which earns a return on equity below its cost of equity will see its common stock sell at a price below its book value.

Q. WHAT ECONOMIC FACTORS HAVE AFFECTED THE COST OF EQUITY CAPITAL FOR PUBLIC UTILITIES?

A. Exhibit_(JRW-5) provides indicators of public utility equity cost rates over the past decade. Page 1 shows the yields on 10-year, 'A' rated public utility bonds. These yields peaked in the 1990s at 10%, and have generally declined since that time. In particular, over the past two years they have declined from the seven percent range to the 4.5 to 5.0 percent range. Page 2 provides the dividend yields for the fifteen utilities in the Dow Jones Utilities Average over the past decade. These yields peaked in 1994 at 7.2%. Since that time they have declined and have remained in the 4.5-5.0 percent range in recent years.

Average earned returns on common equity and market-to-book ratios are given on page 3 of Exhibit_(JRW-5). Over the past decade, earned returns on common equity have consistently been in the 10.0 - 13.0 percent range. The high point was 13.45 % in 2001, and they have decreased since that time. As of 2004, the average was 10.75%. Over the past decade, market-to-book ratios for this group have increased gradually, but with several ups and downs. They peaked in 2001 at 1.83, and have since decreased to the 1.50 range.

The indicators in Exhibit_(JRW-5), coupled with the overall decrease in interest rates, suggest that capital costs for the Dow Jones Utilities have decreased over the past decade. Specifically for the equity cost rate, the increase in the market-to-book ratios, coupled with a slightly

1 lower average return on equity, suggests a decline in the overall equity cost rate.

2 **Q. WHAT FACTORS DETERMINE INVESTORS' EXPECTED OR REQUIRED**
3 **RATE OF RETURN ON EQUITY?**

4 A. The expected or required rate of return on common stock is a function of market-wide, as
5 well as company-specific, factors. The most important market factor is the time value of money as
6 indicated by the level of interest rates in the economy. Common stock investor requirements
7 generally increase and decrease with like changes in interest rates. The perceived risk of a firm is
8 the predominant factor that influences investor return requirements on a company-specific basis. A
9 firm's investment risk is often separated into business and financial risk. Business risk encompasses
10 all factors that affect a firm's operating revenues and expenses. Financial risk results from incurring
11 fixed obligations in the form of debt in financing its assets.

12 **Q. HOW DOES THE INVESTMENT RISK OF WATER UTILITY COMPANIES**
13 **COMPARE WITH THAT OF OTHER INDUSTRIES?**

14 A. Due to the essential nature of their service as well as their regulated status, public utilities are
15 exposed to a lesser degree of business risk than other, non-regulated businesses. This relatively low
16 level of business risk allows public utilities to meet much of their capital requirements through
17 borrowing in the financial markets, thereby incurring greater than average financial risk.
18 Nonetheless, the overall investment risk of public utilities is below most other industries.
19 Exhibit_(JRW-6) provides an assessment of investment risk for 100 industries as measured by beta,
20 which according to modern capital market theory is the only relevant measure of investment risk that

1 need be of concern for investors. These betas come from the *Value Line Investment Survey* and are
2 compiled by Aswath Damodaran of New York University. They may be found on the Internet at
3 <http://www.stern.nyu.edu/~adamodar/>. The study shows that the investment risk of public utilities is
4 relatively low. The average beta for water utilities is in the bottom tenth of the 100 industries in
5 terms of beta. As such, the cost of equity for the water utility industry is among the lowest of all
6 industries in the U.S.

7 **Q. HOW CAN THE EXPECTED OR REQUIRED RATE OF RETURN ON COMMON**
8 **EQUITY CAPITAL BE DETERMINED?**

9 A. The costs of debt and preferred stock are normally based on historical or book values and
10 can be determined with a great degree of accuracy. The cost of common equity capital, however,
11 cannot be determined precisely and must instead be estimated from market data and informed
12 judgment. This return to the stockholder should be commensurate with returns on investments in
13 other enterprises having comparable risks.

14 According to valuation principles, the present value of an asset equals the discounted value
15 of its expected future cash flows. Investors discount these expected cash flows at their required rate
16 of return that, as noted above, reflects the time value of money and the perceived riskiness of the
17 expected future cash flows. As such, the cost of common equity is the rate at which investors
18 discount expected cash flows associated with common stock ownership.

19 Models have been developed to ascertain the cost of common equity capital for a firm. Each
20 model, however, has been developed using restrictive economic assumptions. Consequently,

1 judgment is required in selecting appropriate financial valuation models to estimate a firm's cost of
2 common equity capital, in determining the data inputs for these models, and in interpreting the
3 models' results. All of these decisions must take into consideration the firm involved as well as
4 conditions in the economy and the financial markets.

5 **Q. HOW DO YOU PLAN TO ESTIMATE THE COST OF EQUITY CAPITAL FOR**
6 **THE COMPANY?**

7 A. I rely primarily on the Discounted Cash Flow ("DCF") model to estimate the cost of equity
8 capital. Given the investment valuation process and the relative stability of the utility business, I
9 believe that the DCF model provides the best measure of equity cost rates for public utilities. I have
10 also performed a Capital Asset Pricing Model (CAPM) study, but I give these results less weight
11 because I believe that risk premium studies, of which the CAPM is one form, provide a less reliable
12 indication of equity cost rates for public utilities.

13
14 **B. DISCOUNTED CASH FLOW ANALYSIS**

15
16 **Q. BRIEFLY DESCRIBE THE THEORY BEHIND THE TRADITIONAL DCF**
17 **MODEL.**

18 A. According to the discounted cash flow model, the current stock price is equal to the
19 discounted value of all future dividends that investors expect to receive from investment in the firm.
20 As such, stockholders' returns ultimately result from current as well as future dividends. As owners

of a corporation, common stockholders are entitled to a pro-rata share of the firm's earnings. The DCF model presumes that earnings that are not paid out in the form of dividends are reinvested in the firm so as to provide for future growth in earnings and dividends. The rate at which investors discount future dividends, which reflects the timing and riskiness of the expected cash flows, is interpreted as the market's expected or required return on the common stock. Therefore this discount rate represents the cost of common equity. Algebraically, the DCF model can be expressed as:

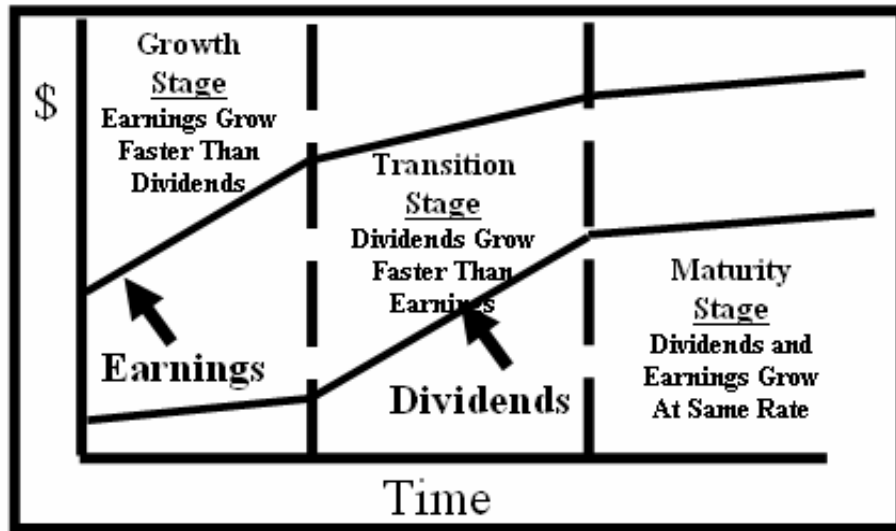
$$P = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_n}{(1+k)^n}$$

where P is the current stock price, D_n is the dividend in year n, and k is the cost of common equity.

Q. IS THE DCF MODEL CONSISTENT WITH VALUATION TECHNIQUES EMPLOYED BY INVESTMENT FIRMS?

A. Yes. Virtually all investment firms use some form of the DCF model as a valuation technique. One common application for investment firms is called the three-stage DCF or dividend discount model (DDM). This model presumes that a company's dividend payout progresses initially through a growth stage, then proceeds through a transition stage, and finally assumes a steady-state stage. The dividend-payment stage of a firm depends on the profitability of its internal investments, which, in turn, is largely a function of the life cycle of the product or service. These stages are depicted in the graphic below labeled the Three-Stage DCF Model.⁵

⁵ This description comes from William F. Sharp, Gordon J. Alexander, and Jeffrey V. Bailey, *Investments* (Prentice-Hall, 1995), pp. 590-91.



Q. HOW DO YOU ESTIMATE STOCKHOLDERS' EXPECTED OR REQUIRED RATE OF RETURN USING THE DCF MODEL?

A. Under certain assumptions, including a constant and infinite expected growth rate, and constant dividend/earnings and price/earnings ratios, the DCF model can be simplified to the following:

$$P = \frac{D_1}{k - g}$$

where D_1 represents the expected dividend over the coming year and g is the expected growth rate of dividends. This is known as the constant-growth version of the DCF model. To use the constant-growth DCF model to estimate a firm's cost of equity, one solves for k in the above expression to obtain the following:

$$k = \frac{D_1}{P} + g$$

The economics of the public utility business indicate that the industry is in the steady-state or constant-growth stage of a three-stage DCF. The economics include the relative stability of the utility business, the maturity of the demand for public utility services, and the regulated status of public utilities (especially the fact that their returns on investment are effectively set through the ratemaking process). The DCF valuation procedure for companies in this stage is the constant-growth DCF. In the constant-growth version of the DCF model, the current dividend payment and stock price are directly observable. Therefore, the primary problem and controversy in applying the DCF model to estimate equity cost rates entails estimating investors' expected dividend growth rate.

Q. WHAT FACTORS SHOULD ONE CONSIDER WHEN APPLYING THE DCF METHODOLOGY?

A. One should be sensitive to several factors when using the DCF model to estimate a firm's cost of equity capital. In general, one must recognize the assumptions under which the DCF model was developed in estimating its components (the dividend yield and expected growth rate). The dividend yield can be measured precisely at any point in time, but tends to vary somewhat over time. Estimation of expected growth is considerably more difficult. One must consider recent firm performance, in conjunction with current economic developments and other information available to investors, to accurately estimate investors' expectations.

1 **Q. PLEASE DISCUSS EXHIBIT_(JRW-7).**

2 A. My DCF analysis is provided in Exhibit_(JRW-7). The DCF summary is on page 1 of
3 this Exhibit and the supporting data and analysis for the dividend yield and expected growth rate
4 are provided on the following pages.

5 **Q. WHAT DIVIDEND YIELDS ARE YOU EMPLOYING IN YOUR DCF ANALYSIS**
6 **FOR YOUR TWO GROUPS OF WATER UTILITY COMPANIES?**

7 A. The dividend yields on the common stock for the companies in the two groups are
8 provided on page 2 of Exhibit_(JRW-7) for the six -month period ending July, 2006. Over this
9 period, the average monthly dividend yields for the SWC and LWC Groups were 3.10% and
10 2.40%, respectively. As of July, 2006, the mean dividend yields for the SWC and LWC Groups
11 were 3.50% and 2.70%, respectively. For the DCF dividend yields for the two groups, I use the
12 average of the six month and July, 2006 dividend yields. Hence, the DCF dividends yields for
13 the SWC and LWC Groups are 3.30% and 2.55%, respectively.

14 **Q. PLEASE DISCUSS THE APPROPRIATE ADJUSTMENT TO THE SPOT**
15 **DIVIDEND YIELD.**

16 A. According to the traditional DCF model, the dividend yield term relates to the dividend yield
17 over the coming period. As indicated by Professor Myron Gordon, who is commonly associated
18 with the development of the DCF model for popular use, this is obtained by (1) multiplying the
19 expected dividend over the coming quarter by 4, and (2) dividing this dividend by the current stock
20 price to determine the appropriate dividend yield for a firm, which pays dividends on a quarterly

1 basis.⁶

2 In applying the DCF model, some analysts adjust the current dividend for growth over the
3 coming year as opposed to the coming quarter. This can be complicated because firms tend to
4 announce changes in dividends at different times during the year. As such, the dividend yield
5 computed based on presumed growth over the coming quarter as opposed to the coming year can be
6 quite different. Consequently, it is common for analysts to adjust the dividend yield by some
7 fraction of the long-term expected growth rate.

8 The appropriate adjustment to the dividend yield is further complicated in the regulatory
9 process when the overall cost of capital is applied to a projected or end-of-future-test-year rate base.
10 The net effect of this application is an overstatement of the equity cost rate estimate derived from
11 the DCF model. In the context of the constant-growth DCF model, both the adjusted dividend yield
12 and the growth component are overstated. The overstatement results from applying an equity cost
13 rate computed using current market data to a future or test-year-end rate base which includes growth
14 associated with the retention of earnings during the year. In other words, an equity cost rate times a
15 future, yet to be achieved rate base, results in an inflated dividend yield and growth rate.

16 **Q. GIVEN THIS DISCUSSION, WHAT ADJUSTMENT FACTOR WILL YOU USE**
17 **FOR YOUR DIVIDEND YIELD?**

18 A. I will adjust the dividend yield by 1/2 the expected growth so as to reflect growth over the
19 coming year.

⁶ *Petition for Modification of Prescribed Rate of Return*, Federal Communications Commission, Docket No. 79-05,

1 **Q. PLEASE DISCUSS THE GROWTH RATE COMPONENT OF THE DCF MODEL.**

2 A. There is much debate as to the proper methodology to employ in estimating the growth
3 component of the DCF model. By definition, this component is investors' expectation of the long-
4 term dividend growth rate. In developing growth expectations, investors have access to both
5 historical and projected growth rates for earnings and dividends per share and for internal or book
6 value growth.

7 **Q. WHAT GROWTH DATA HAVE YOU REVIEWED FOR THE TWO GROUPS OF**
8 **WATER COMPANIES?**

9 A. I have analyzed a number of measures of growth for the water utility companies. I
10 considered historical growth rates in sales, earnings per share (EPS), dividends per share (DPS), and
11 book value per share (BVPS). I have reviewed *Value Line's* historical and projected growth rate
12 estimates for EPS, DPS, and BVPS. In addition, I have utilized the average EPS growth rate
13 forecasts of Wall Street analysts as provided by Zacks, Reuters, and First Call. These services solicit
14 5-year earning growth rate projections for securities analysts and compile and publish the averages
15 of these forecasts on the Internet. Finally, I have also assessed prospective growth as measured by
16 prospective earnings retention rates and earned returns on common equity.

17 **Q. PLEASE DISCUSS HISTORICAL GROWTH IN EARNINGS AND DIVIDENDS AS**
18 **WELL AS INTERNAL GROWTH.**

19 A. Historical growth rates for sales, EPS, DPS, and BVPS are readily available to virtually all

Direct Testimony of Myron J. Gordon and Lawrence I. Gould at 62 (April 1980).

investors and presumably are an important ingredient in forming expectations concerning future growth. However, one must use historical growth numbers as measures of investors' expectations with caution. In some cases, past growth may not reflect future growth potential. Also, employing a single growth rate number (for example, for five or ten years), is unlikely to accurately measure investors' expectations due to the sensitivity of a single growth rate figure to fluctuations in individual firm performance as well as overall economic fluctuations (i.e., business cycles). However, one must appraise the context in which the growth rate is being employed. According to the conventional DCF model, the expected return on a security is equal to the sum of the dividend yield and the expected long-term growth in dividends. Therefore, to best estimate the cost of common equity capital using the conventional DCF model, one must look to long-term growth rate expectations.

Internally generated growth is a function of the percentage of earnings retained within the firm (the earnings retention rate) and the rate of return earned on those earnings (the return on equity). The internal growth rate is computed as the retention rate times the return on equity. Internal growth is significant in determining long-run earnings and, therefore, dividends. Investors recognize the importance of internally generated growth and pay premiums for stocks of companies that retain earnings and earn high returns on internal investments.

Q. PLEASE DISCUSS THE HISTORICAL GROWTH OF THE COMPANIES IN THE TWO GROUPS.

A. Page 3 of Exhibit_(JRW-7) provides the 3-, 5-, and 10- year compounded annual growth

1 rates for the companies in the two groups. For the SWC Group, EPS growth is the lowest and also
2 the most volatile. The other growth rates are more consistent over time, with sales growth in the 5.0-
3 6.0 percent range, DPS growth in the 2.0-3.0 percent range, and BVPS growth in 3.0-5.0 percent
4 range. Overall, considering the means and medians of historical sales, EPS, DPS, and BVPS growth
5 rate, annual historical growth appears to be about 3.0-3.5 percent range. historical growth for the
6 LWC Group is higher – in the 5.0 percent range – with otherwise similar growth rate characteristics
7 as the SWC Group. DPS growth is the lowest and EPS growth is the most volatile. The other
8 growth rates are more consistent, with the sales growth rate being the highest.

9 **Q. PLEASE SUMMARIZE YOUR ANALYSIS OF *VALUE LINE*'S HISTORICAL AND**
10 **PROJECTED GROWTH RATES FOR THE TWO GROUPS OF WATER UTILITY**
11 **COMPANIES.**

12 A. Page 4 of Exhibit_(JRW-7) provides a summary of historical growth rates for the companies
13 in the group as provided in the *Value Line Investment Survey*. The coverage of the SWC Group is
14 very limited (only three companies) and provides little insight into expected growth. Average
15 historical growth in EPS, DPS, and BVPS for the LWC Group ranges from 2.3% to 5.5%, with an
16 average of 4.0%. Projections of EPS, DPS, and BVPS growth are available for three of the four
17 companies in the LWC Group in *Value Line*. For these three companies, the average of projected
18 growth for earnings, dividends, and book value is 5.9%. For the LWC Group, prospective internal
19 growth of 4.7% is indicated, with *Value Line*'s average projected retention and equity return rates of
20 44.8% and 10.4%.

1 **Q. PLEASE ASSESS GROWTH FOR THE GROUPS AS MEASURED BY ANALYSTS’**
2 **FORECASTS OF EXPECTED 5-YEAR GROWTH IN EPS.**

3 A. Zacks, First Call, and Reuters collect, summarize, and publish Wall Street analysts’
4 projected 5-year EPS growth rate forecasts for companies. These forecasts are provided for the
5 SWC and LWC Group companies on page 5 of Exhibit_(JRW-7). For the SWC Group, the average
6 of the analysts’ projected growth forecasts is 7.63%. Analysts’ growth forecasts are available for
7 three of the four companies in the LWC Group, and the average is 6.91%.⁷

8 **Q. PLEASE SUMMARIZE YOUR ANALYSIS OF THE HISTORICAL AND**
9 **PROSPECTIVE GROWTH OF THE TWO WATER COMPANY GROUPS.**

10 A. The table below shows the summary DCF growth rate indicators for the two groups of water
11 utility companies. For the SWC Group, the average of historical mean and median growth rate
12 measures in sales, EPS, DPS, and BVPS is 3.1%. *Value Line*’s historical and prospective growth
13 rate figures for the SWC are very limited and not likely to provide much guidance to investors. The
14 average projected EPS growth rates for companies in the group is 7.6%. Since there is very little
15 coverage of the companies in the group, and given the well-known upward bias in analysts’ EPS
16 growth rate projections, investors are likely to look to historical growth rates as well as the projected
17 growth figures. Given a historical and projected growth rate range of 3.1% to 7.6% for the SWC
18 Group, and placing greater weight to the projected growth rate figures, an expected growth rate of

⁷Since there is considerable overlap in analyst coverage between the three services, and not all of the companies have forecasts from the different services, I have averaged the expected 5-year EPS growth rates from the three services for each company to arrive at an expected EPS growth rate by company.

6.0% is reasonable for these smaller water companies.

For the LWC Group, historical growth rate measures are in the 4.0-5.0 percent range. The average projected growth rate in EPS, DPS, and BVPS from Value Line is 4.0%. Prospective internal growth is 4.7%, and the average projected EPS growth rate for the LWC Group is 7.0%. Giving more weight to the projected growth rate figures, expected DCF growth would appear to be in the 6.5% range for the LWC Group.

DCF Growth Rate Indicators

Growth Rate Indicator	SWC Group	LWC Group
Historic Growth in Sales, EPS, DPS, and BVPS	3.1%	4.8%
Historic Value Line Growth in EPS, DPS, and BVPS	NA	4.0%
Projected Value Line Growth in EPS, DPS, and BVPS	NA	5.9%
Internal Growth ROE * Retention rate	1.8%	4.7%
Projected EPS Growth from First Call, Reuters, and Zacks	7.6%	6.9%

Q. BASED ON THE ABOVE ANALYSIS, WHAT ARE YOUR INDICATED COMMON EQUITY COST RATES FROM THE DCF MODEL FOR THE SWC AND LWC GROUPS?

A. My DCF-derived equity cost rate for the two groups are:

$$\text{DCF Equity Cost Rate (k)} = \frac{D}{P} + g$$

	Dividend Yield	½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
SWC Group	3.50%	1.03000	6.00%	9.40%
LWC Group	2.55%	1.03250	6.50%	9.13%

These results are summarized on page 1 of Exhibit_(JRW-7).

C. CAPITAL ASSET PRICING MODEL RESULTS

Q. PLEASE DISCUSS THE CAPITAL ASSET PRICING MODEL (CAPM).

A. The CAPM is a more general risk premium approach to gauging a firm's cost of equity capital. According to the risk premium approach, the cost of equity is the sum of the interest rate on a risk-free bond (R_f) and a risk premium (RP), as in the following:

$$k = R_f + RP$$

The yield on long-term Treasury securities is normally used as R_f . Risk premiums are measured in different ways. The CAPM is a theory of the risk and expected returns of common stocks. In the CAPM, two types of risk are associated with a stock: firm-specific risk or unsystematic risk; and

market or systematic risk, which is measured by a firm's beta. The only risk that investors receive a return for bearing is systematic risk.

According to the CAPM, the expected return on a company's stock, which is also the equity cost rate (K), is equal to:

$$K = (R_f) + \beta_{ibm} * [E(R_m) - (R_f)]$$

Where:

- K represents the estimated rate of return on the stock;
- $E(R_m)$ represents the expected return on the overall stock market. Frequently, the 'market' refers to the S&P 500;
- (R_f) represents the risk-free rate of interest;
- $[E(R_m) - (R_f)]$ represents the expected equity or market risk premium—the excess return that an investor expects to receive above the risk-free rate for investing in risky stocks; and
- $Beta$ —(β_i) is a measure of the systematic risk of an asset.

To estimate the required return or cost of equity using the CAPM requires three inputs: the risk-free rate of interest (R_f), the beta (β_i), and the expected equity or market risk premium, $[E(R_m) - (R_f)]$. R_f is the easiest of the inputs to measure – it is the yield on long-term Treasury bonds. β_i , the measure of systematic risk, is a little more difficult to measure because there are different opinions about what adjustments, if any, should be made to historical betas due to their tendency to regress to 1.0 over time. And finally, an even more difficult input to measure is the expected equity or market risk premium, $[E(R_m) - (R_f)]$. I will discuss each of these inputs, with most of the discussion focusing on the expected equity risk premium.

Q. PLEASE DISCUSS EXHIBIT_(JRW-8).

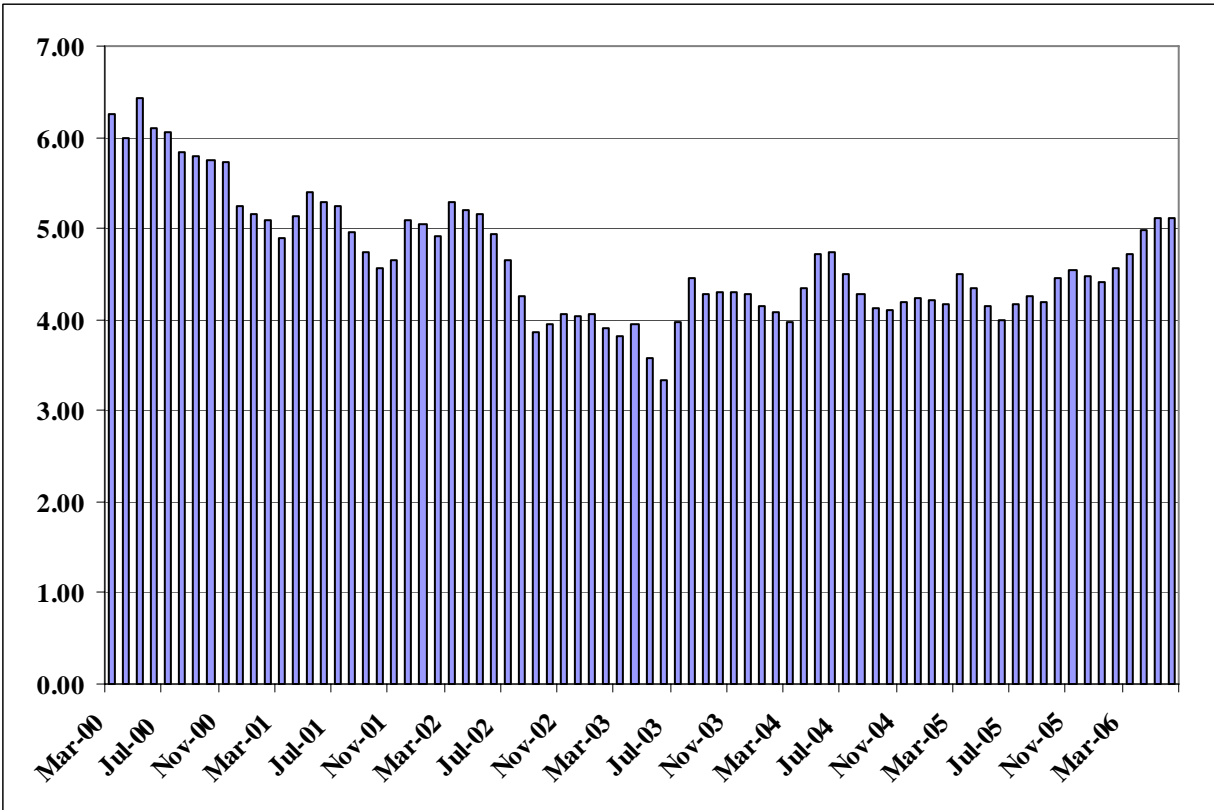
A. Exhibit_(JRW-8) provides the summary results for my CAPM study. Page 1 shows the

1 results, and the pages following it, contain the supporting data.

2 **Q. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.**

3 A. The yield on long-term Treasury bonds has usually been viewed as the risk-free rate of
4 interest in the CAPM. The yield on long-term Treasury bonds, in turn, has been considered to be the
5 yield on Treasury bonds with 30-year maturities. However, since the Treasury issuance of 30-Year
6 Treasuries was interrupted for a period of time in recent years, the yield on 10-year Treasury
7 bonds has replaced the yield on 30-year Treasury bonds as the benchmark long-term Treasury
8 rate. The 10-year Treasury yields over the past five years are shown in the chart below. These
9 rates hit a 60-year low in the summer of 2003 at 3.33%. They increased with the rebounding
10 economy and fluctuated in the 4.0-4.50 percent range over the past three years until advancing to
11 5.0% in recent months in response to a strong economy and increases in energy, commodity, and
12 consumer prices.

13 **Ten-Year U.S. Treasury Yields**
14 **January 2000-June 2006**



Source: <http://www.federalreserve.gov/releases/h15/current/h15.pdf>

Q. WHAT RISK-FREE INTEREST RATE ARE YOU USING IN YOUR CAPM?

A. With the growing budget deficit, the U.S. Treasury has decided to again begin issuing a 30-year bond. As such, the market may again begin to focus on its yield as the benchmark for long-term capital costs in the U.S.

In recent months, the yields on the 10- and 30- year Treasuries have increased and have been in the 5.00%-5.25% range. As of July 6, 2006, as shown in the table below, the rates on 10- and 30-

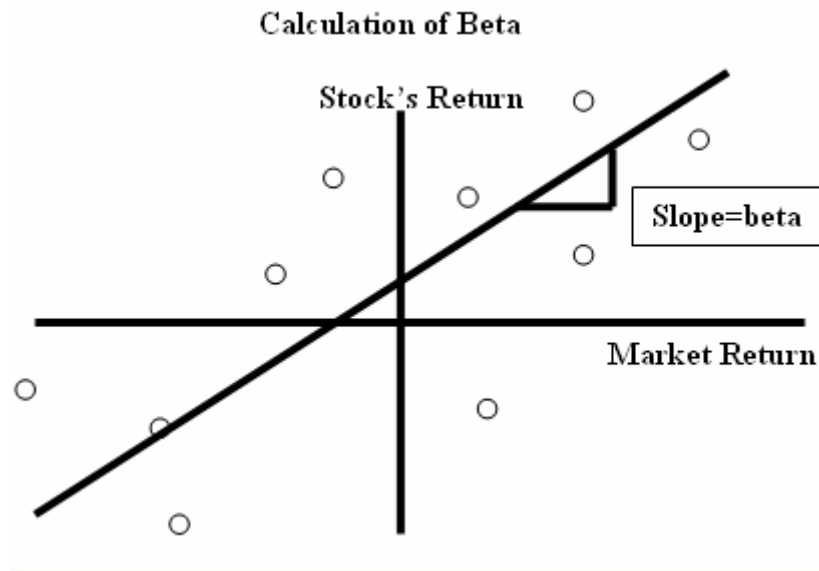
Treasuries were 5.19% and 5.23%, respectively. Given this recent range and recent movement, I will use 5.25% as the risk-free rate, or R_f , in my CAPM.

**U.S. Treasury Yields
July 6, 2006**

NOTES/BONDS			
	COUPON	MATURITY DATE	CURRENT PRICE/YIELD
2-YEAR	5.125	06/30/2008	99-26+ / 5.22
3-YEAR	4.875	05/15/2009	99-06 / 5.18
5-YEAR	5.125	06/30/2011	99-27+ / 5.16
10-YEAR	5.125	05/15/2016	99-15¼ / 5.19
30-YEAR	4.500	02/15/2036	89-01+ / 5.23

Q. WHAT BETAS ARE YOU EMPLOYING IN YOUR CAPM?

A. Beta (β) is a measure of the systematic risk of a stock. The market, usually taken to be the S&P 500, has a beta of 1.0. The beta of a stock with the same price movement as the market also has a beta of 1.0. A stock whose price movement is greater than that of the market, such as a technology stock, is riskier than the market and has a beta greater than 1.0. A stock with below average price movement, such as that of a regulated public utility, is less risky than the market and has a beta less than 1.0. Estimating a stock's beta involves running a linear regression of a stock's return on the market return as in the following:



The slope of the regression line is the stock's β . A steeper line indicates the stock is more sensitive to the return on the overall market. This means that the stock has a higher β and greater than average market risk. A less steep line indicates a lower β and less market risk.

Numerous online investment information services, such as Yahoo and Reuters, provide estimates of stock betas. Usually these services report different betas for the same stock. The differences are usually due to (1) the time period over which the β is measured and (2) any adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time. In estimating an equity cost rate for the two groups of water utility companies, I am using the average betas for the companies as provided in the *Value Line Investment Survey*. As shown on page 2 of Exhibit_(JRW-8), the mean for the SWC and LWC Groups are 0.67 and 0.74.

Q. PLEASE DISCUSS ANY OPPOSING VIEWS REGARDING THE EQUITY RISK PREMIUM.

1 A. The equity or market risk premium— $[E(R_m) - R_f]$: is equal to the expected return on the
2 stock market (e.g., the expected return on the S&P 500 ($E(R_m)$) minus the risk-free rate of
3 interest (R_f). The equity premium is the difference in the expected total return between investing in
4 equities and investing in “safe” fixed-income assets, such as long-term government bonds.
5 However, while the equity risk premium is easy to define conceptually, it is difficult to measure
6 because it requires an estimate of the expected return on the market.

7 **Q. PLEASE DISCUSS THE ALTERNATIVE APPROACHES TO ESTIMATING**
8 **THE EQUITY RISK PREMIUM.**

9 A. The table below highlights the primary approaches to, and issues in, estimating the
10 expected equity risk premium. The traditional way to measure the equity risk premium was to
11 use the difference between historical average stock and bond returns. In this case, historical
12 stock and bond returns, also called ex post returns, were used as the measures of the market’s
13 expected return (known as the ex ante or forward-looking expected return). This type of
14 historical evaluation of stock and bond returns is often called the “Ibbotson approach” after
15 Professor Roger Ibbotson who popularized this method of using historical financial market
16 returns as measures of expected returns. Most historical assessments of the equity risk premium
17 suggest an equity risk premium of 5-7 percent above the rate on long-term Treasury bonds.
18 However, this can be a problem because (1) ex post returns are not the same as ex ante
19 expectations, (2) market risk premiums can change over time, increasing when investors become
20 more risk-averse, and decreasing when investors become less risk-averse, and (3) market

conditions can change such that ex post historical returns are poor estimates of ex ante expectations.

Risk Premium Approaches

	Historical Ex Post Excess Returns	Surveys	Ex Ante Models and Market Data
Means of Assessing the Equity-Bond Risk Premium	Historical average is a popular proxy for the ex ante premium – but likely to be misleading	Investor and expert surveys can provide direct estimates of prevailing expected returns/premiums	Current financial market prices (simple valuation ratios or DCF-based measures) can give most objective estimates of feasible ex ante equity-bond risk premium
Problems/Debated Issues	Time variation in required returns and systematic selection and other biases have boosted valuations over time, and have exaggerated realized excess equity returns compared with ex ante expected premiums	Limited survey histories and questions of survey representativeness. Surveys may tell more about hoped-for expected returns than about objective required premiums due to irrational biases such as extrapolation.	Assumptions needed for DCF inputs, notably the trend earnings growth rate, make even these models' outputs subjective. The range of views on the growth rate, as well as the debate on the relevant stock and bond yields, leads to a range of premium estimates.

Source: Antti Ilmanen, Expected Returns on Stocks and Bonds,” *Journal of Portfolio Management*, (Winter 2003).

The use of historical returns as market expectations has been criticized in numerous academic studies.⁸ The general theme of these studies is that the large equity risk premium discovered in historical stock and bond returns cannot be justified by the fundamental data. These studies, which fall under the category “Ex Ante Models and Market Data,” compute ex ante expected returns using market data to arrive at an expected equity risk premium. These studies have also been called “Puzzle Research” after the famous study by Mehra and Prescott in which the

⁸ The problems with using ex post historical returns as measures of ex ante expectations will be discussed at length later in my testimony.

1 authors first questioned the magnitude of historical equity risk premiums relative to fundamentals.⁹

2 **Q. PLEASE BRIEFLY SUMMARIZE SOME OF THE NEW ACADEMIC STUDIES**
3 **THAT DEVELOP EX ANTE EQUITY RISK PREMIUMS.**

4 A. Two of the most prominent studies of ex ante expected equity risk premiums were by
5 Eugene Fama and Ken French (2002) and James Claus and Jacob Thomas (2001). The primary
6 debate in these studies revolves around two related issues: (1) the size of expected equity risk
7 premium, which is the return equity investors require above the yield on bonds; and (2) the fact that
8 estimates of the ex ante expected equity risk premium using fundamental firm data (earnings and
9 dividends) are much lower than estimates using historical stock and bond return data. Fama and
10 French (2002), two of the most preeminent scholars in finance, use dividend and earnings growth
11 models to estimate expected stock returns and ex ante expected equity risk premiums.¹⁰ They
12 compare these results to actual stock returns over the period 1951-2000. Fama and French estimate
13 that the expected equity risk premium from DCF models using dividend and earnings growth to be
14 between 2.55% and 4.32%. These figures are much lower than the ex post historical equity risk
15 premium produced from the average stock and bond return over the same period, which is 7.40%.

16 Fama and French conclude that the ex ante equity risk premium estimates using DCF
17 models and fundamental data are superior to those using ex post historical stock returns for three
18 reasons: (1) the estimates are more precise (a lower standard error); (2) the Sharpe ratio, which is
19 measured as the $[(\text{expected stock return} - \text{risk-free rate})/\text{standard deviation}]$, is constant over

⁹ Rahnish Mehra and Edward Prescott, "The Equity Premium: A Puzzle," *Journal of Monetary Economics* (1985).

1 time for the DCF models but varies considerably over time and more than doubles for the
2 average stock-bond return model; and (3) valuation theory specifies relationships between the
3 market-to-book ratio, return on investment, and cost of equity capital that favor estimates from
4 fundamentals. They also conclude that the high average stock returns over the past 50 years
5 were the result of low expected returns and that the average equity risk premium has been in the
6 3-4 percent range.

7 The study by Claus and Thomas of Columbia University provides direct support for the
8 findings of Fama and French.¹¹ These authors compute ex ante expected equity risk premiums over
9 the 1985-1998 period by (1) computing the discount rate that equates market values with the present
10 value of expected future cash flows, and (2) then subtracting the risk-free interest rate. The expected
11 cash flows are developed using analysts' earnings forecasts. The authors conclude that over this
12 period the ex ante expected equity risk premium is in the range of 3.0%. Claus and Thomas note
13 that, over this period, ex post historical stock returns overstate the ex ante expected equity risk
14 premium because, as the expected equity risk premium has declined, stock prices have risen. In
15 other words, from a valuation perspective, the present value of expected future returns increase when
16 the required rate of return decreases. The higher stock prices have produced stock returns that have
17 exceeded investors' expectations and therefore ex post historical equity risk premium estimates are
18 biased upwards as measures of ex ante expected equity risk premiums.

¹⁰ Eugene F. Fama and Kenneth R. French, "The Equity Premium," *The Journal of Finance*, (April 2002).

¹¹ James Claus and Jacob Thomas, "Equity Risk Premia as Low as Three Percent? Empirical Evidence from Analysts' Earnings Forecasts for Domestic and International Stock Market," *Journal of Finance*. (October 2001).

1 **Q. PLEASE PROVIDE A SUMMARY OF THE EX ANTE EQUITY RISK**
2 **PREMIUM STUDIES.**

3 A. Richard Derrig and Elisha Orr (2003) recently completed the most comprehensive paper to
4 date which summarizes and assesses the many risk premium studies.¹² These authors reviewed the
5 various approaches to estimating the equity risk premium, and the overall results. Page 3 of
6 Exhibit_(JRW-8) provides a summary of the results of the primary risk premium studies reviewed
7 by Derrig and Orr. In developing page 3 of Exhibit_(JRW-8), I have (1) updated the results of the
8 studies that have been updated by the various authors, (2) included the results of several additional
9 studies and surveys, and (3) included the results of the “Building Blocks” approach to estimating the
10 equity risk premium, including a study I performed which is presented below.

11 On page 3, the risk premium studies listed under the ‘Social Security’ and ‘Puzzle Research’
12 sections are primarily ex ante expected equity risk premium studies (as discussed above). Most of
13 these studies are performed by leading academic scholars in finance and economics. Also provided
14 are the results of studies by Ibbotson and Peng and myself which use the Building Blocks approach.

15 **Q. PLEASE DISCUSS YOUR DEVELOPMENT OF AN EX ANTE EXPECTED**
16 **EQUITY RISK PREMIUM COMPUTED USING THE BUILDING BLOCKS**
17 **METHODOLOGY.**

18 A. Ibbotson and Chen (2002) evaluate the ex post historical mean stock and bond returns in

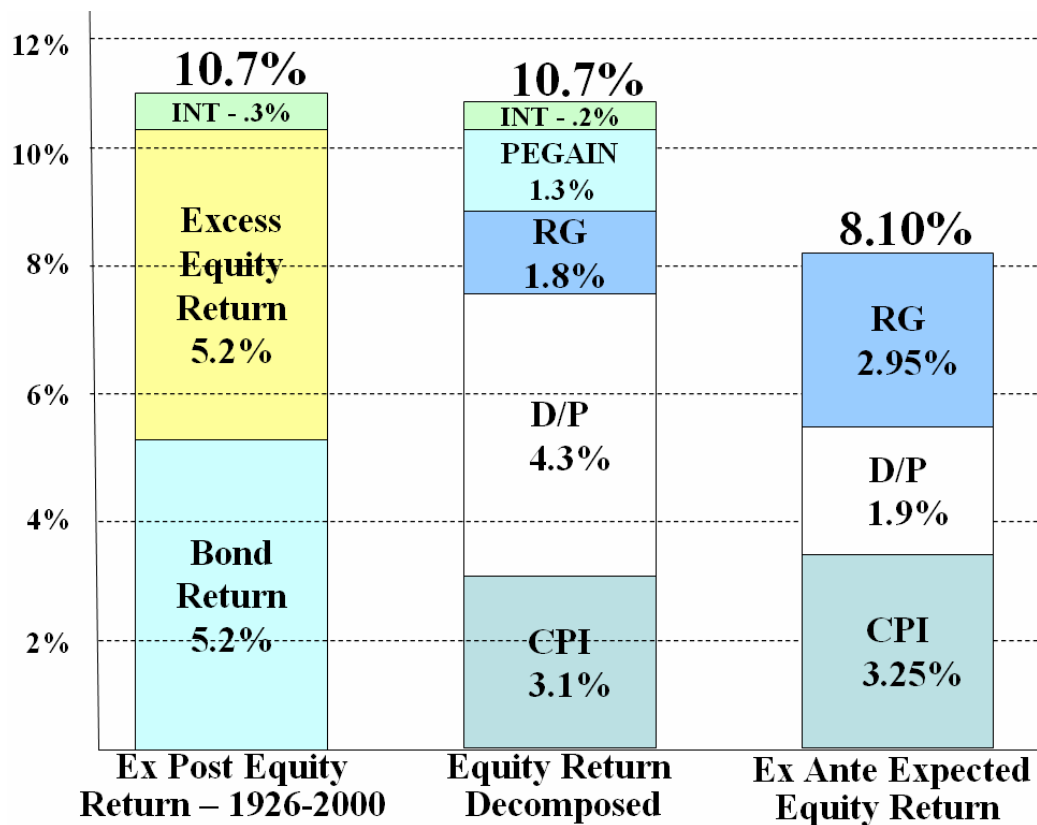
¹² Richard Derrig and Elisha Orr, “Equity Risk Premium: Expectations Great and Small,” Working Paper (version 3.0), Automobile Insurers Bureau of Massachusetts, August 28, 2003.

1 what is called the Building Blocks approach.¹³ They use 75 years of data and relate the
2 compounded historical returns to the different fundamental variables employed by different
3 researchers in building ex ante expected equity risk premiums. Among the variables included
4 were inflation, real EPS and DPS growth, ROE and book value growth, and P/E ratios. By
5 relating the fundamental factors to the ex post historical returns, the methodology bridges the
6 gap between the ex post and ex ante equity risk premiums. Ilmanen (2003) illustrates this
7 approach using the geometric returns and five fundamental variables – inflation (CPI), dividend
8 yield (D/P), real earnings growth (RG), repricing gains (PEGAIN) and return
9 interaction/reinvestment (INT).¹⁴ This is shown in the graph below. The first column breaks
10 the 1926-2000 geometric mean stock return of 10.7% into the different return components
11 demanded by investors: the historical Treasury bond return (5.2%), the excess equity return
12 (5.2%), and a small interaction term (0.3%). This 10.7% annual stock return over the 1926-2000
13 period can then be broken down into the following fundamental elements: inflation (3.1%),
14 dividend yield (4.3%), real earnings growth (1.8%), repricing gains (1.3%) associated with
15 higher P/E ratios, and a small interaction term (0.2%).

Decomposing Equity Market Returns The Building Blocks Methodology

¹³ Roger Ibbotson and Peng Chen, “Long Run Returns: Participating in the Real Economy,” *Financial Analysts Journal*, January 2003.

¹⁴ Antti Ilmanen, Expected Returns on Stocks and Bonds,” *Journal of Portfolio Management*, (Winter 2003), p. 11.



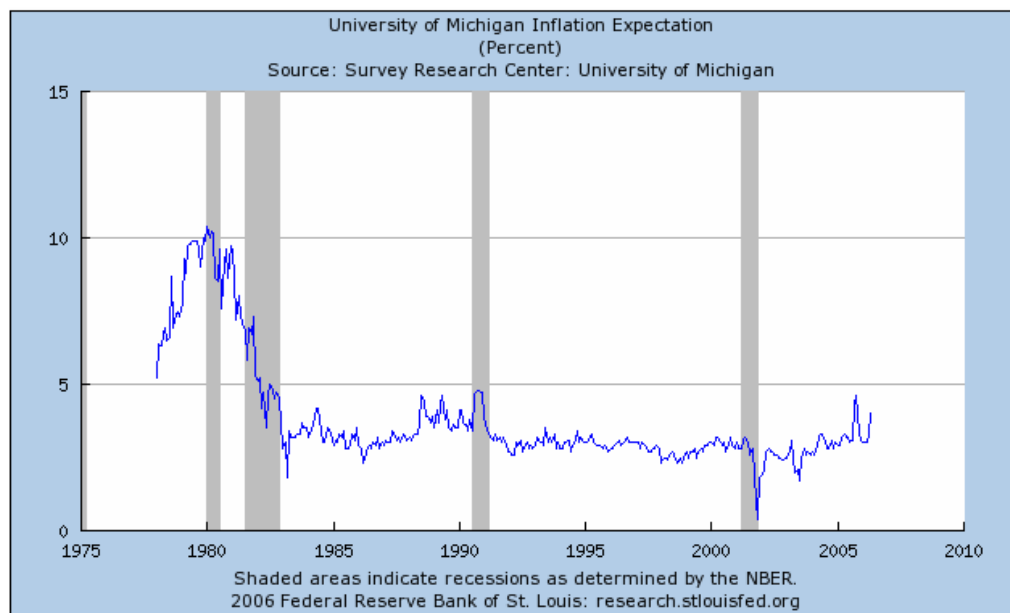
Q. HOW ARE YOU USING THIS METHODOLOGY TO DERIVE AN EX ANTE EXPECTED EQUITY RISK PREMIUM?

A. The third column in the graph above shows current inputs to estimate an ex ante expected market return. These inputs include the following:

CPI – To assess expected inflation, I have employed expectations of the short-term and long-term inflation rate. The graph below shows the expected annual inflation rate according to consumers, as measured by the CPI, over the coming year. This survey is published monthly by the University of Michigan Survey Research Center. This survey is published monthly by the University

of Michigan Survey Research Center. In the most recent report, the expected one-year expected inflation rate was 4.0%.

Expected Inflation Rate
University of Michigan Consumer Research
(Data Source: <http://research.stlouisfed.org/fred2/series/MICH/98>)



Longer term inflation forecasts are available in the Federal Reserve Bank of Philadelphia's publication entitled *Survey of Professional Forecasters*.¹⁵ This survey of professional economists has been published for almost 50 years. While this survey is published quarterly, only the first quarter survey includes long-term forecasts of GDP growth, inflation, and market

¹⁵Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters*, February 14, 2005. The *Survey of Professional Forecasters* was formerly conducted by the American Statistical Association (ASA) and the National Bureau of Economic Research (NBER) and was known as the ASA/NBER survey. The survey, which began in 1968, is conducted each quarter. The Federal Reserve Bank of Philadelphia, in cooperation with the NBER, assumed responsibility for the survey in June 1990.

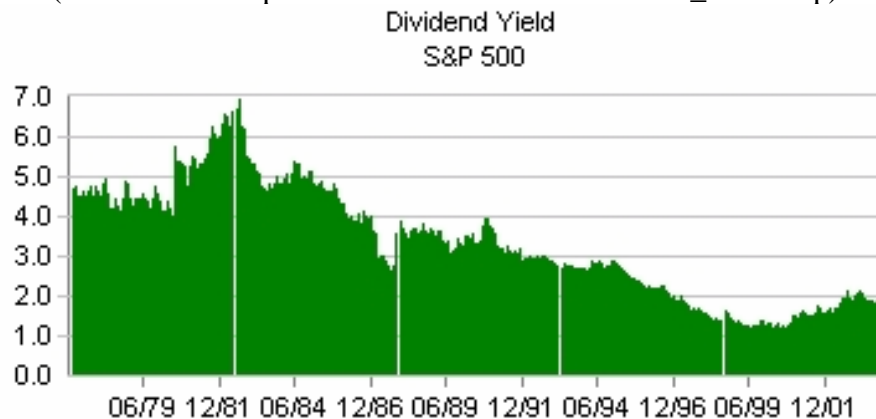
returns. In the first quarter, 2006 survey, published on February 13, 2006, the median long-term (10-term) expected inflation rate as measured by the CPI was 2.50% (see page 4 of Exhibit_(JRW-8)).

Given these results, I will use the average of the University of Michigan and Philadelphia Federal Reserve's surveys (4.0% and 2.50%), or 3.25%.

D/P – As shown in the graph below, the dividend yield on the S&P 500 has decreased gradually over the past decade. Today, it is far below its norm of 4.3% over the 1926-2000 time period. Whereas the S&P dividend yield bottomed out at less than 1.4% in 2000, it is currently at 1.9% which I use in the ex ante risk premium analysis.

S&P 500 Dividend Yield

(Data Source: http://www.barra.com/Research/fund_charts.asp)



RG – To measure expected real growth in earnings, I use (1) the historical real earnings growth rate for the S&P 500, and (2) expected real GDP growth. The S&P 500 was created in 1960. It includes 500 companies which come from ten different sectors of the economy. Over

1 the 1960-2005 period, nominal growth in EPS for the S&P 500 was 7.11%. On page 5 of
2 Exhibit_(JRW-8), real EPS growth is computed using the CPI as a measure of inflation. As
3 indicated by Ibbotson and Chen, real earnings growth over the 1926-2000 period was 1.8%. The
4 real growth figure over 1960-2005 period for the S&P 500 is 2.7%.

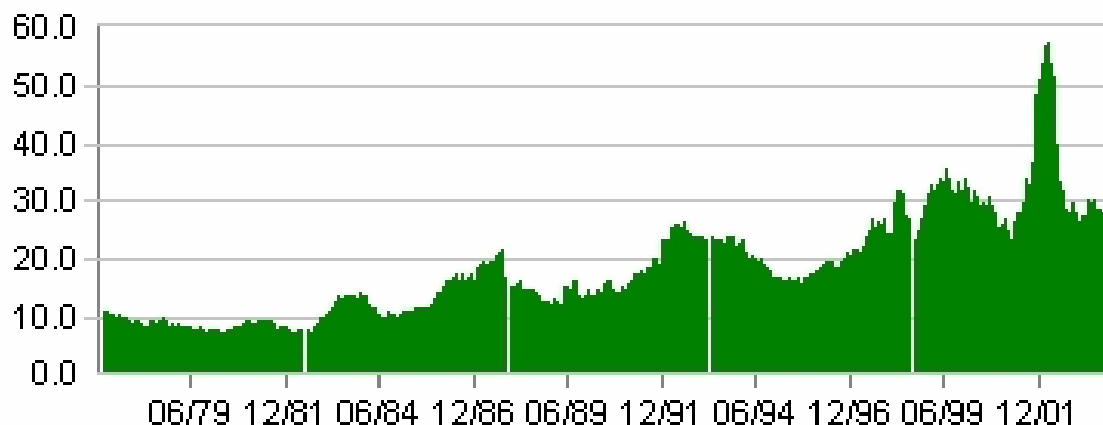
5 The second input for expected real earnings growth is expected real GDP growth. The
6 rationale is that over the long-term, corporate profits have averaged a relatively consistent 5.50%
7 of US GDP.¹⁶ Real GDP growth, according to McKinsey, has averaged 3.5% over the past 80
8 years. Expected GDP growth, according to the Federal Reserve Bank of Philadelphia's *Survey*
9 *of Professional Forecasters*, is 3.3% (see page 4 of Exhibit_(JRW-8)).

10 Given these results, I will use the average of the historical S&P EPS real growth and the
11 historical real GDP growth (and as supported by the Philadelphia Federal Reserve survey of
12 expected GDP growth) (2.7% and 3.2%), or 2.95%, for real earnings growth.

13 PEGAIN – the repricing gains associated with increases in the P/E ratio accounted for 1.3%
14 of the 10.7% annual stock return in the 1926-2000 period. In estimating an ex ante expected stock
15 market return, one issue is whether investors expect P/E ratios to increase from their current levels.
16 The graph below shows the P/E ratios for the S&P 500 over the past 25 years. The run-up and
17 eventual peak in P/Es is most notable in the chart. The relatively low P/E ratios (in the range of 10)
18 over two decades ago are also quite notable. As of July, 2006 the P/E for the S&P 500, using the
19 trailing 12 months EPS, is 20.05 according to www.investor.reuters.com.

Given the current economic and capital markets environment, I do not believe that investors expect even higher P/E ratios. Therefore, a PEGAIN would not be appropriate in estimating an ex ante expected stock market return. There are two primary reasons for this. First, the average historical S&P 500 P/E ratio is 15 – thus the current P/E exceeds this figure by almost 50%. Second, as previously noted, interest rates are at a cyclical low not seen in almost 50 years. This is a primary reason for the high current P/Es. Given the current market environment with relatively high P/E ratios and low relative interest rate, investors are not likely to expect to get stock market gains from lower interest rates and higher P/E ratios.

S&P 500 P/E Ratios
(Data Source: http://www.barra.com/Research/fund_charts.asp)
Price/Earnings (Incl Negative)
S&P 500



Q. GIVEN THIS DISCUSSION, WHAT IS YOUR EX ANTE EXPECTED MARKET RETURN AND EQUITY RISK PREMIUM USING THE “BUILDING BLOCKS

¹⁶ Marc. H. Goedhart, et al, “The Real Cost of Equity,” *McKinsey on Finance* (Autumn 2002), p.14.

METHODOLOGY”?

A. My expected market return is represented by the last column on the right in the graph entitled “Decomposing Equity Market Returns: The Building Blocks Methodology” found earlier in my testimony. As shown on page 38, my expected market return is 8.10% which is composed of 3.25% expected inflation, 1.90% dividend yield, and 2.95% real earnings growth rate.

Expected Inflation	Dividend Yield	Real Earnings Growth Rate	Expected Market Return
3.25%	1.90%	2.95%	8.10%

Q. GIVEN THAT THE HISTORICAL COMPOUNDED ANNUAL MARKET RETURN IS IN EXCESS OF 10%, WHY DO YOU BELIEVE THAT YOUR EXPECTED MARKET RETURN OF 8.10% IS REASONABLE?

A. As discussed above in the development of the expected market return, stock prices are relatively high at the present time in relation to earnings and dividends and interest rates are relatively low. Hence, it is unlikely that investors are going to experience high stock market returns due to higher P/E ratios and/or lower interest rates. In addition, as shown in the decomposition of equity market returns, whereas the dividend portion of the return was historically 4.3%, the current dividend yield is only 1.9%. Due to these reasons, lower market returns are expected for the future.

1 **Q. IS YOUR EXPECTED MARKET RETURN OF 8.10% CONSISTENT WITH THE**
2 **FORECASTS OF MARKET PROFESSIONALS?**

3 A. Yes. The only survey of market professionals dealing with forecasts of stock market
4 returns is published by the previously-referenced Federal Reserve Bank of Philadelphia. In the
5 first quarter, 2006 survey, published on February 13, 2006, the median long-term expected return
6 on the S&P 500 was 7.00 (see page 4 of Exhibit_(JRW-8)). This is clearly consistent with my
7 expected market return of 8.10%.

8 **Q. GIVEN THIS EXPECTED MARKET RETURN, WHAT IS YOUR EX ANTE**
9 **EQUITY RISK PREMIUM USING THE BUILDING BLOCKS METHODOLOGY?**

10 A. As shown above, the current 30-year treasury yield is 5.23%. My ex ante equity risk
11 premium is simply the expected market return from the Building Blocks methodology minus this
12 risk-free rate:

$$\text{Ex Ante Equity Risk Premium} = 8.05\% - 5.23\% = 2.87\%$$

14 **Q. GIVEN THIS DISCUSSION, HOW ARE YOU MEASURING AN EXPECTED**
15 **EQUITY RISK PREMIUM IN THIS PROCEEDING?**

16 A. As discussed above, page 3 of Exhibit_(JRW-8) provides a summary of the results of a
17 variety of the equity risk premium studies. These include the results of (1) the study of historical
18 risk premiums as provided by Ibbotson, (2) ex ante equity risk premium studies (studies
19 commissioned by the Social Security Administration as well as those labeled 'Puzzle Research'), (3)

equity risk premium surveys of CFOs, Financial Forecasters, as well as academics, (4) Building Block approaches to the equity risk premium, and (5) other miscellaneous studies. The overall average equity risk premium of these studies is 4.15%, which I will use as the equity risk premium in my CAPM study.

Q. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS OF LEADING INVESTMENT FIRMS?

A. Yes. One of the first studies in this area was by Stephen Einhorn, one of Wall Street's leading investment strategists.¹⁷ His study showed that the market or equity risk premium had declined to the 2.0 to 3.0 percent range by the early 1990s. Among the evidence he provided in support of a lower equity risk premium is the inverse relationship between real interest rates (observed interest rates minus inflation) and stock prices. He noted that the decline in the market risk premium has led to a significant change in the relationship between interest rates and stock prices. One implication of this development was that stock prices had increased higher than would be suggested by the historical relationship between valuation levels and interest rates.

The equity risk premiums of some of the other leading investment firms today support the result of the academic studies. An article in *The Economist* indicated that some other firms like J.P. Morgan are estimating an equity risk premium for an average risk stock in the 2.0 to 3.0 percent range above the interest rate on U.S. Treasury Bonds.¹⁸

¹⁷ Steven G. Einhorn, "The Perplexing Issue of Valuation: Will the Real Value Please Stand Up?" *Financial Analysts Journal* (July-August 1990), pp. 11-16.

¹⁸ For example, see "Welcome to Bull Country," *The Economist* (July 18, 1998), pp. 21-3, and "Choosing the Right

1 **Q. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE**
2 **EQUITY RISK PREMIUMS USED BY CORPORATE CHIEF FINANCIAL OFFICERS**
3 **(CFOs)?**

4 A. Yes. John Graham and Campbell Harvey of Duke University surveyed CFOs to ascertain
5 their ex ante equity risk premium. In Graham and Harvey's 2003 survey, the average ex ante 10-
6 year equity risk premium of the CFOs was 3.8%.¹⁹

7 **Q. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EX**
8 **ANTE EQUITY RISK PREMIUMS OF PROFESSIONAL FORECASTERS?**

9 A. Yes. The financial forecasters in the previously-referenced Federal Reserve Bank of
10 Philadelphia survey project both stock and bond returns. As shown on page 4 of Exhibit_(JRW-
11 8)), the median long-term expected stock and bond returns were 7.00% and 5.00%, respectively.
12 This provides an ex ante equity risk premium of 2.00%.

13 **Q. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE**
14 **EQUITY RISK PREMIUMS USED BY THE LEADING CONSULTING FIRMS?**

15 A. Yes. McKinsey & Co. is widely recognized as the leading management consulting firm in
16 the world. They recently published a study entitled "The Real Cost of Equity" in which they
17 developed an ex ante equity risk premium for the US. In reference to the decline in the equity risk

Mixture," *The Economist* (February 27, 1999), pp. 71-2.

¹⁹John R. Graham and Campbell Harvey, "Expectations of Equity Risk Premia, Volatility, and Asymmetry," Duke University Working Paper, 2003.

premium, as well as what is the appropriate equity risk premium to employ for corporate valuation purposes, the McKinsey authors concluded the following:

We attribute this decline not to equities becoming less risky (the inflation-adjusted cost of equity has not changed) but to investors demanding higher returns in real terms on government bonds after the inflation shocks of the late 1970s and early 1980s. We believe that using an equity risk premium of 3.5 to 4 percent in the current environment better reflects the true long-term opportunity cost of equity capital and hence will yield more accurate valuations for companies.²⁰

Q. WHAT EQUITY COST RATE IS INDICATED BY YOUR CAPM ANALYSIS?

A. The results of my CAPM study for the two groups of water utility companies as well as Tega Cay are provided below:

$$K = (R_f) + \beta_{ibm} * [E(R_m) - (R_f)]$$

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
SWC Group	5.25%	0.67	4.15%	8.00%
LWC Group	5.25%	0.74	4.15%	8.30%

D. EQUITY COST RATE SUMMARY

Q. PLEASE SUMMARIZE YOUR EQUITY COST RATE STUDY.

A. The results for my DCF and CAPM analyses for the two groups of water utility companies are indicated below:

²⁰Marc H. Goedhart, et al, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p.15. .

	DCF	CAPM
SWC Group	9.40 %	8.0%
LWC Group	9.13%	8.3%

Q. GIVEN THESE RESULTS, WHAT IS YOUR ESTIMATED EQUITY COST RATE FOR THE TWO GROUPS OF WATER COMPANIES?

A. Giving these results, I conclude that the equity cost rate for the two groups of water utilities is in the 8.00-9.40 percent range. For a smaller water utility such as Tega Cay, an equity cost rate in the upper end of the range is appropriate. As such, I am recommending an equity cost rate range of 9.00%-9.40%.

Q. ISN'T THIS RATE OF RETURN LOW BY HISTOIRCAL STANDARDS?

A. Yes it is, and appropriately so. My rate of return is low by historical standards for three reasons. First, as discussed above, current capital costs are very low by historical standards, with interest rates at a cyclical low not seen since the 1960s. Second, the 2003 tax law, which reduces the tax rates on dividend income and capital gains, lowers the pre-tax return required by investors. And third, as discussed below, the equity or market risk premium has declined.

Q. FINALLY, PLEASE DISCUSS YOUR RATE OF RETURN IN LIGHT OF RECENT YIELDS ON 'A' RATED PUBLIC UTILITY BONDS.

A. In recent months the yields on long-term public utility bonds have been in the 6.00 percent range. My rate of return may appear to be too low given these yields. However, as previously noted, my recommendation must be viewed in the context of the significant decline in the market or equity

1 risk premium. As a result, the return premium that equity investors require over bond yields is much
2 lower than today. This decline was previously reviewed in my discussion of capital costs in today's
3 markets. In addition, it will be examined in more depth in my rebuttal testimony.

4 **Q. HOW DO YOU TEST THE REASONABLENESS OF YOUR COST OF EQUITY**
5 **AND OVERALL RATE OF RETURN RECOMMENDATION?**

6 A. To test the reasonableness of my 9.00%-9.40% equity cost rate recommendation, I examine
7 the relationship between the return on common equity and the market-to-book ratios for the two
8 groups of water utility companies. To assess the adequacy of my overall rate of return
9 recommendation, I evaluate the implied interest coverage ratios.

10 **Q. WHAT DO THE RETURNS ON COMMON EQUITY AND MARKET-TO-BOOK**
11 **RATIOS FOR THE GROUPS OF WATER UTILITIES INDICATE ABOUT THE**
12 **REASONABLENESS OF YOUR 9.00%-9.40% RECOMMENDATION?**

13 A. Exhibit_(JRW-3) provides financial performance and market valuation statistics for the two
14 groups of water utility companies. The current return on equity and market-to-book ratios for the
15 two groups are summarized below:

	Current ROE	Market-to-Book Ratio
SWC Group	9.3 %	248
LWC Group	10.9%	263

16 Source: Exhibit_(JRW-3).

17 These results clearly indicate that, on average, these companies are earning returns on equity above
18 their equity cost rates. As such, this observation provides evidence that my recommended equity
19 cost rate of 9.00%-9.40% is reasonable and fully consistent with the financial performance and

market valuation of the two groups of water utility companies.

Q. WHAT DO THE IMPLIED INTEREST COVERAGE RATIOS INDICATED ABOUT THE ADEQUACY OF YOUR OVERALL RATE OF RETURN RECOMMENDATION FOR TEGA CAY?

A. The implied pre- and post- tax interest coverage ratios, computed on page 1 of Exhibit_(JRW-1), are shown below:

Tega Cay	Pre-Tax Interest Coverage	Post-Tax Interest Coverage
ROE = 9.00%	2.57X	1.97X
ROE = 9.40%	2.64X	2.01X

Source: Exhibit_(JRW-1).

Exhibit_(JRW-3) provides financial performance and market valuation statistics for the two groups of water utility companies. The average pre-tax interest coverage ratios for the two groups are 2.56X and 2.88X. For Tega Cay, the corresponding pre-tax coverage ratios are 2.57 with a ROE of 9.00% and 2.64 with a ROE of 9.40%. This indicates that my overall recommended rate of return is adequate in terms of the implied interest coverage ratios.

V. CRITIQUE OF TEGA CAY'S RATE OF RETURN TESTIMONY

Q. PLEASE SUMMARIZE TEGA CAY'S OVERALL RATE OF RETURN RECOMMENDATION.

A. Tega Cay's rate of return recommendation is provided by Ms. Pauline M. Ahern. She has proposed a capital structure consisting of 59.1% long-term debt and 40.9% common equity with a

debt cost rate of 6.42% and an equity cost rate range of 11.45% to 12.00%. Tega Cay's overall recommendation is summarized below:

Capital Source	Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	59.10%	4.612%	3.79%
Common Equity	40.90%	11.45% – 12.00%	4.68%
Total	100.00%		8.47%

Q. PLEASE EVALUATE THE COMPANY'S RATE OF RETURN POSITION.

A. Tega Cay's proposed rate of return is excessive due to an overstated equity cost rate.

Q. PLEASE REVIEW MS. AHERN'S EQUITY COST RATE APPROACHES.

A. Ms. Ahern estimates an equity cost rate for Tega Cay by applying four equity cost rate models to two proxy groups of water utility companies. Her equity cost rate approaches include a DCF model, a comparable earnings analysis, a historical risk premium, and the CAPM. Her equity cost rate estimates and recommendation are summarized below:

Summary of Approaches and Results

	<u>Seven AUS Water Companies</u>	<u>Four Value Line Water Companies</u>
DCF Model	9.9%	10.2%
Risk Premium Model	11.1%	11.2%
CAPM	10.5%	10.7%
Comparable Earnings	13.9%	14.1%
Indicated Equity Cost Rate Range	10.9%	11.45%
Business Risk Adjustment	0.35%	0.35%
Finance Risk Adjustment	0.20%	0.20%
Common Equity Cost Rate	11.45%	12.00%

Ms. Ahern's equity cost rate is too high primarily because of (1) an upwardly-biased DCF

1 growth rate for her two groups of water utility companies, (2) outdated and biased equity risk
2 premium estimates for her risk premium and CAPM analyses and a flawed Comparable Earnings
3 (CE) analysis, (3) an unjustified business risk adjustment, and (4) an unwarranted financial risk
4 adjustment.

5 **Q. BEFORE ADDRESSING MS. AHERN'S EQUITY COST RATE APPROACHES,**
6 **PLEASE INITIALLY DISCUSS THE PROBLEMS WITH HER BUSINESS AND**
7 **FINANCIAL RISK ADJUSTMENTS.**

8 A. Ms. Ahern's size / business risk adjustment is ad hoc and unjustified. She cites figures
9 relating to the size of Tega Cay relative to the water companies in the two groups and uses this to
10 justify her adjustment. Business risk relates to the risk associated with variation in operating
11 revenues and expenses and not necessarily to the size of a business. Ms. Ahern performs no study
12 comparing the variation in operating income between Tega Cay and the two groups and therefore
13 she has not demonstrated that Tega Cay has higher size/ business risk.

14 Ms. Ahern does support her size adjustment on the basis of a historical return analysis
15 performed by Ibbotson Associates. As discussed later in my testimony, there are a number of
16 errors in using historical market returns to compute risk premiums. Nonetheless, Ms. Ahern's
17 assessment of the size-related stock returns is incorrect. For example, the returns she uses on
18 page 3 of Schedule PMA-1 to justify the size premiums are developed by Ibbotson Associates.
19 The analysis is provided on page 15 of Schedule PMA-1. The size premium is based on the
20 stock returns for companies in the 10th decile. However, a review of page 15 shows that the

1 average beta for companies in the 10th decile is 1.38. This is a beta that is twice that of water
2 utilities. Hence, this is a premium that is not associated with the water utility industry.

3 As a final point on the size / business risk adjustment, Professor Annie Wong tested for a
4 size premium in utilities and concluded that size premiums such as proposed by Ms. Ahern do
5 not apply to utilities.²¹

6 On the financial risk adjustment, Ms. Ahern has used the summary results of a 20-year study
7 to make her adjustment. Not only is the study dated in the sense that it uses very old data, but also
8 the results relate specifically to the companies that are employed in the study and, more importantly,
9 to the data and methodology used to compute the cost of equity capital for the different companies in
10 assessing the financial risk adjustment.

11 On another note, Tega Cay is owned by Utilities, Inc. Utilities Inc, in turn, is owned by
12 Nuon Global Solutions USA, Inc., which is owned by Hydro Star, LLC, which is a subsidiary of
13 AIG Highstar Capital II, L.P. (Highstar II). Highstar II consists of a group of private equity funds
14 sponsored by the AIG Global Investment Group. AIG Global Investment Group is an indirect
15 subsidiary of American International Group, one of the largest financial services organizations in the
16 world. The management of Tega Cay' parent, Utilities, Inc., can elect to capitalize Tega Cay as it
17 sees fit. Being a private company, neither Tega Cay nor its parent, Utilities, Inc., need to conform to
18 market standards or norms. In the context of Ms. Ahern's financial risk adjustment, there is no need

²¹ Annie Wong, "Utility Stocks and the Size Effect: An Empirical Analysis", *Journal of the Midwest Finance Association*, 1993, PP. 95-101.

to provide an additional return to the Company, based on the discretion of the management of Utilities, Inc., on how it wants to capitalize Tega Cay.

Q. DO YOU HAVE ANY ISSUES WITH MS. AHERN'S TWO GROUPS OF WATER COMPANIES?

A. In general, I do not. However, she does include Southwest Water in the Value Line group and, I noted above, this company receives only 39% of revenues from water operations.

Q. PLEASE SUMMARIZE MS. AHERN'S DCF ESTIMATES.

A. On pages 23-36 of her testimony and in Schedules PMA-5 – PMA-9, Ms. Ahern develops an equity cost rate by applying a traditional DCF model to her two groups of water companies. The DCF approach derives an equity cost rate as the sum of the dividend yield and expected growth. Ms. Ahern employs two alternative growth rate methodologies for both groups. First, she averages historical and projected EPS, DPS, and B*R + S*V growth rates. Second, she employs the average EPS forecasted growth rates of analysts. After arriving at a DCF equity cost rate for each group, she makes a leverage adjustment to reflect the difference between the market value and book value capital structures of the companies in the group. Ms. Ahern's results are summarized below.

DCF Equity Cost Rate
Seven AUS Water Companies

	DCF With historical and Projected DPS, EPS, and BR + SV Growth	DCF With Projected EPS Growth
Adjusted Dividend Yield	2.90%	3.00%
Growth	5.6%	7.6%
DCF Result	9.90%	9.90%

Indicated Equity Cost Rate 9.90%

DCF Equity Cost Rate
Four Value Line Water Companies

	DCF With historical and Projected DPS, EPS, and BR + SV Growth	DCF With Projected EPS Growth
Adjusted Dividend Yield	2.60%	2.60%
Growth	6.60%	8.50%
DCF Result	11.30%	9.00%

Indicated Equity Cost Rate **10.2%**

Q. WHAT ISSUES DO YOU HAVE WITH MS. AHERN'S DCF APPROACH AND EQUITY COST RATE ESTIMATES?

A. I have two issues with her DCF approach and estimates. These include: (1) her arbitrary elimination of certain DCF results, and (2) her excessive reliance on the upwardly biased EPS growth rates forecasts of Wall Street analysts and *Value Line*.

Q. WHAT IS YOUR CONCERN REGARDING MS. AHERN'S ELIMINATION OF THE RESULTS FOR CERTAIN COMPANIES?

A. Ms. Ahern uses a hurdle rate of 8.8% for individual company results to be included in her DCF equity cost rate study. The 8.8% hurdle rate is the sum of projected yield of 6.8% on 'A' rated public utility bonds plus 200 basis points. There are two issues with this hurdle rate. First, the projected yield of 6.8% is above current yields on 'A' rated public utility bonds. Second, and most importantly, the 200 basis points premium is her assessment of an appropriate risk premium. She has performed no studies, and she has provided no basis to support this figure.

1 **Q. PLEASE REVIEW MS. AHERN'S EXCESSIVE RELIANCE ON ANALYSTS'**
2 **PROJECTED EPS GROWTH RATE ESTIMATES.**

3 A. Ms. Ahern has relied excessively on the EPS forecasts of Wall Street analysts and *Value*
4 *Line* to gauge growth for her DCF model. It seems highly unlikely that investors today would rely
5 excessively on the forecasts of securities analysts, and ignore historical growth, in arriving at
6 expected growth. In the academic world, the fact that the EPS forecasts of securities analysts are
7 overly optimistic and biased upwards has been known for years. In addition, as I show below, *Value*
8 *Line's* EPS forecasts are excessive and unrealistic.

9 **Q. PLEASE REVIEW THE BIAS IN ANALYSTS' GROWTH RATE FORECASTS.**

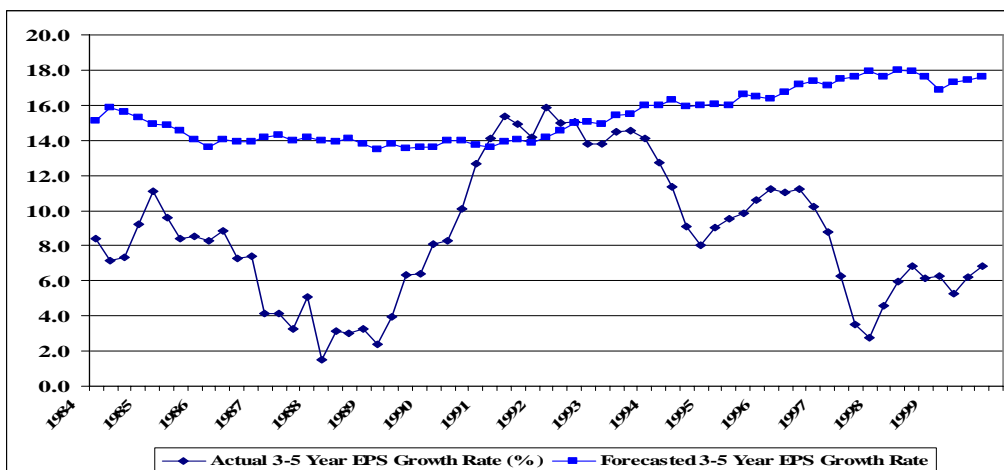
10 A. Analysts' growth rate forecasts are collected and published by Zacks, First Call, I/B/E/S, and
11 Reuters. These services retrieve and compile EPS forecasts from Wall Street Analysts. These
12 analysts come from both the sell side (Merrill Lynch, Paine Webber) and the buy side (Prudential
13 Insurance, Fidelity).

14 The problem with using these forecasts to estimate a DCF growth rate is that the
15 objectivity of Wall Street research has been challenged, and many have argued that analysts'
16 EPS forecasts are overly optimistic and biased upwards. To evaluate the accuracy of analysts' EPS
17 forecasts, I have compared actual 3-5 year EPS growth rates with forecasted EPS growth rates on
18 a quarterly basis over the past 20 years for all companies covered by the I/B/E/S data base. In
19 the graph below, I show the average forecasted 3-5 year EPS growth rate with the average actual
20 3-5 year EPS growth rate. Because of the necessary 3-5 year follow-up period to measure actual

1 growth, the analysis in this graph only (1) covers forecasted and actual EPS growth rates through
2 1999, and (2) includes only companies that have 3-5 years of actual EPS data following the
3 forecast period.

4 The following example shows how the results can be interpreted. As of the first quarter
5 of 1995, analysts were projecting an average 3-5-year annual EPS growth rate of 15.98%, but
6 companies only generated an average annual EPS growth rate over the next 3-5 years of 8.14%.
7 This 15.98% figure represented the average projected growth rate for 1,115 companies, with an
8 average of 4.70 analysts' forecasts per company over the 20 year period covered by the study.
9 The only periods when firms met or exceeded analysts' EPS growth rate expectations were for
10 six consecutive quarters in 1991-92 following the one-year economic downturn at the turn of the
11 decade. Over the entire time period, Wall Street analysts have continually forecasted 3-5-year
12 EPS growth rates in the 14-18 percent range (mean = 15.32%), but these firms have only
13 delivered an average EPS growth rate of 8.75%.

14 **Analysts' Forecasted 3-5-Year Forecasted Versus Actual EPS Growth Rates**
15 **1984-1999**



Source: J. Randall Woolridge.

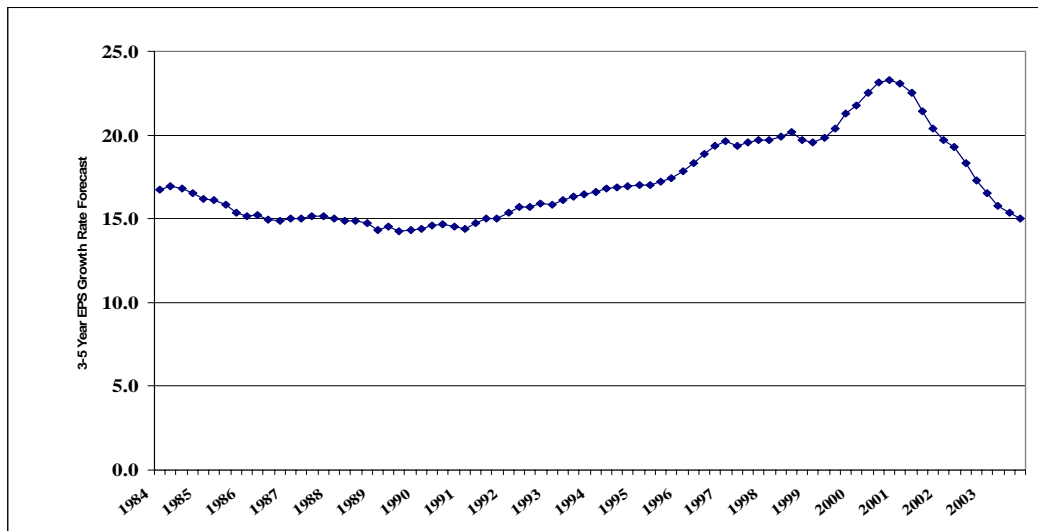
The post-1999 period has seen the boom and then the bust in the stock market, an economic recession, 9/11, and the Iraq war. Furthermore, and highly significant in the context of this study, we have also had the Elliott Spitzer investigation of Wall Street firms and the subsequent Global Securities Settlement in which nine major brokerage firms paid a fine of \$1.5B for their biased investment research.

To evaluate the impact of these events on analysts' forecasts, the graph below provides the average 3-5-year EPS growth rate projections for all companies provided in the I/B/E/S database on a quarterly basis from 1985 to 2004. In this graph, no comparison to actual EPS growth rates is made and hence there is no follow-up period. Therefore, 3-5 year growth rate forecasts are shown until 2004.²² Analysts' forecasts for EPS growth were higher for this larger

²² The number of companies in the sample grows from 2,220 in 1984, peaks at 4,610 in 1998, and then declines to 3,351 in 2004. The number of analysts' forecasts per company averages between 3.75 to 5.10, with an overall mean of 4.37.

sample of firms, with a more pronounced run-up and then decline around the stock market peak in 2000. The average projected growth rate hovered in the 14.5%-17.5% range until 1995, and then increased dramatically over the next five years to 23.3% in the fourth quarter of the year 2000. Forecasted growth has since declined to the 15.0% range.

**Mean Analysts' 3-5-Year Forecasted EPS Growth Rates
1985-2004**



Source: J. Randall Woolridge.

While analysts' EPS growth rates forecasts have subsided since 2000, these results suggest that, despite the Elliot Spitzer investigation and the Global Securities Settlement, analysts' EPS

forecasts are still upwardly biased. The actual 3-5 year EPS growth rate over time has been about one-half the projected 3-5 year growth rate forecast of 15.0%. Furthermore, as discussed above, historical growth in GNP and corporate earnings has been in the 7% range. As such, an EPS growth rate forecast of 15% does not reflect economic reality. This observation is supported by a *Wall Street Journal* article entitled “Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant – and the Estimates Help to Buoy the Market’s Valuation.” The following quote provides insight into the continuing bias in analysts’ forecasts:

Hope springs eternal, says Mark Donovan, who manages Boston Partners Large Cap Value Fund. ‘You would have thought that, given what happened in the last three years, people would have given up the ghost. But in large measure they have not.’

These overly optimistic growth estimates also show that, even with all the regulatory focus on too-bullish analysts allegedly influenced by their firms’ investment-banking relationships, a lot of things haven’t changed: Research remains rosy and many believe it always will.²³

Q. ARE VALUE LINE’S GROWTH RATE FORECASTS SIMILARLY UPWARDLY BIASED?

A. Yes. *Value Line* has a decidedly positive bias to its earnings growth rate forecasts as well. To assess *Value Line*’s earnings growth rate forecasts, I used the *Value Line Investment Analyzer*. The results are summarized in the table below. I initially filtered the database and found that Value Line has 3-5 year EPS growth rate forecasts for 2587 firms. The average projected EPS growth rate

²³ Ken Brown, “Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant – and the Estimates

was 16.0%!! This is incredibly high given that the average historical EPS growth rate in the US is about seven percent! Equally incredible is that *Value Line* only predicts negative EPS growth for sixteen companies. That is less than one percent of the companies covered by *Value Line*. Given the ups and downs of corporate earnings, I believe that this is unreasonable.

Value Line 3-5 year EPS Growth Rate Forecasts

	Average Projected EPS Growth rate	Number of Negative EPS Growth Projections	Percent of Negative EPS Growth Projections
2587 Firms	16.0%	16	0.62%

To put this figure in perspective, I screened the 2587 firms with 3-5 year growth rate forecasts to see what percent had experienced negative EPS growth rates over the past five years. *Value Line* reported a five-year historic growth rate for 1626 of the 2587 companies. It should be noted that the past five years have been a period of rapidly rising corporate earnings as the economy and businesses have rebounded from the recession of 2001. These results, shown in the table below, indicate that the average historic growth was 9.51% and *Value Line* reported negative historic growth for 380 firms which represents 23.4% of these companies.

**Historic Five-Year EPS Growth Rates for Companies with
Value Line 3-5 year EPS Growth Rate Forecasts**

	Average Historic	Number with	Percent with
--	------------------	-------------	--------------

Help to Buoy the Market's Valuation." *Wall Street Journal*, (January 27, 2003), p. C1.

	EPS Growth rate	Negative Historic EPS Growth	Negative Historic EPS Growth
1626 Firms	9.51%	380	23.4%

These results indicate that *Value Line*'s EPS forecasts are excessive and unrealistic. It appears that analysts at *Value Line* are similar to the analysts at Wall Street firms and view future earnings through 'rose-colored' glasses and provide overly-optimistic forecasts of future growth.

Q. PLEASE SUMMARIZE YOUR ASSESSMENT OF MS. AHERN'S DCF APPROACH.

A. Ms. Ahern's DCF results should be ignored. She has arbitrarily eliminated some DCF results for companies in her proxy groups because she felt the equity cost estimates were too low. Furthermore, her growth rate estimates for the water utility companies are upwardly biased because she has relied excessively on analysts' and *Value Line*'s forecasts of EPS growth to measure a DCF growth rate. As demonstrated and discussed above, analysts' and *Value Line*'s EPS growth rate forecasts are upwardly biased measures of actual growth. Hence, it is highly unlikely that investors would simply look to these biased forecasts as the only measures of expected growth.

Q. PLEASE REVIEW MS. AHERN'S RISK PREMIUM ANALYSIS.

A. Ms. Ahern arrives at a risk premium derived equity cost rates of 11.1% and 11.2% for the Company using the two proxy groups. This figure is the sum of the adjusted base yield of 6.80% and an equity risk premium of 4.3% for the seven company group and 4.4% for the four company group. Her risk premium equity cost estimates are excessive due to an overstated base yield and

biased and inflated equity risk premiums that do not reflect today's investment fundamentals. Her results are summarized below.

**Risk Premium Equity Cost Rate
Water Utility Proxy Groups**

	<u>Seven AUS</u> <u>Water Companies</u>	<u>Four Value Line</u> <u>Water Companies</u>
Prospective AAA Bond Yield	6.30%	6.30%
AAA-A Yield Differential	0.50%	0.50%
Adjusted Prospective A Bond Yield	6.80%	6.80%
Equity Risk Premium	4.30%	4.40%
Risk Premium Equity Cost Rate	11.10%	11.20%

Q. PLEASE DISCUSS THE BASE YIELD OF MS. AHERN'S RISK PREMIUM ANALYSIS.

A. The base yield of 6.8% is the sum of the forecasted Aaa corporate bond rate of 6.30% (from the *Blue Chip Financial Forecasts*) plus 50 basis points to account for the yield differential between Aaa rated corporate and A rated public utility bonds.

Q. PLEASE EVALUATE THE BASE YIELD OF MS. AHERN'S RISK PREMIUM ANALYSIS.

A. The base yield of 6.8% is excessive for three reasons. First, the forecasted Aaa corporate bond rate of 6.30% is above the current Aaa corporate bond rate, which has been in the 5.75% range in recent months. Second, employing the yield on long-term risky bonds overstates the required return on equity in two ways: (a) long-term bonds are subject to interest rate risk, a risk which does not affect common stockholders since dividend payments (unlike bond interest payments) are not

1 fixed but tend to increase over time and (b) the base yield is subject to credit risk since it is not
2 default risk-free like an obligation of the U.S. Treasury. As a result, its yield-to-maturity includes a
3 premium for default risk and therefore is above its expected return.

4 **Q. PLEASE REVIEW MS. AHERN'S RISK PREMIUM STUDIES.**

5 A. Ms. Ahern averages the results of two risk premium studies, which appear in Schedule
6 PMA-10, to arrive at the equity risk premiums of 4.3% and 4.4%. In her first study, she averages the
7 results of historical and projected equity risk studies for her two groups of water utility companies.
8 She computes a historical risk premium as the difference between the historical stock and bond
9 returns over the 1926 and 2005 period. She also calculates an expected equity risk premium as the
10 difference between the *Value Line* projected overall stock market return and the forecasted Aaa
11 corporate bond rate. She then adjusts the average of the historical and projected equity risk
12 premiums by the adjusted betas for the two proxy groups to arrive at beta-adjusted equity risk
13 premiums of 4.2% and 4.4% for the six and four company water proxy groups. In Ms. Ahern's
14 second study, she computes an equity risk premium as the difference between the returns on the
15 S&P Public Utility Index returns and 'A' rated Public Utility bonds over the period 1928-2005.
16 After adjusting the result for bond rating differentials, this approach yields an equity risk premium of
17 4.4%.

18 Ms. Ahern's overall equity risk premiums of 4.3% and 4.4% are the result of averaging the
19 4.4% equity risk premium from the study of public utility stock and bonds returns with the 4.2% and
20 4.4% equity risk premiums for the seven- and four- groups in the first study. I will initially discuss

Ms. Ahern's use of *Value Line*'s projected market return, and then evaluate her use of historical returns in her risk premium studies.

Q. PLEASE CRITIQUE MS. AHERN'S PROSPECTIVE EQUITY OR MARKET RISK PREMIUM WHICH SHE CALCULATES USING VALUE LINE'S PROJECTED RETURNS.

A. The primary error in using *Value Line's* 3-5 year annual return projections is that these projections are consistently high relative to actual experienced returns and, as such, provide upwardly biased equity or market risk premiums. This bias is highlighted in a study shown on page 1 of Exhibit_(JRW-9). Over the 1984-2004 time period, this study demonstrates that *Value Line's* projected 3-5 year annual return has been, on average, 3.24 percent above the actual 3-5 year annual return. As such, *Value Line's* 3-5 year annual returns produce upwardly-biased equity or market risk premiums.

This positive bias in *Value Line's* 3-5 year annual returns that I show above is corroborated in a study performed by *Value Line* itself. Page 2 of Exhibit_(JRW-9) shows *Value Line's* own study that demonstrates that it's projected market returns have been in excess of the actual returns.

Q. PLEASE DISCUSS THE USE OF HISTORICAL RETURNS TO COMPUTE A FORWARD-LOOKING OR EX ANTE RISK PREMIUM.

A. As noted, Ms. Ahern has used historical stock and bond returns to compute an expected risk premium. Her historical evaluation of stock and bond returns is often called the "Ibbotson approach" after Professor Roger Ibbotson who popularized this method of assessing historical financial market

1 returns. This historical approach was discussed previously as one of the three approaches to
2 estimating an equity risk premium for the CAPM. Ms. Ahern evaluates the historical stock-bond
3 return relationship for the overall market and for public utility stocks over the 1926-2004 period.

4 Using the historical relationship between stock and bond returns to measure an ex ante
5 equity risk premium is erroneous and, especially in this case, overstates the true market equity risk
6 premium. The equity risk premium is based on expectations of the future and when past market
7 conditions vary significantly from the present, historical data does not provide a realistic or accurate
8 barometer of expectations of the future. At the present time, using historical returns to measure the
9 ex ante equity risk premium ignores current market conditions and masks the dramatic change in the
10 risk and return relationship between stocks and bonds. This change suggests that the equity risk
11 premium has declined.

12 **Q. PLEASE DISCUSS THE ERRORS IN USING HISTORICAL STOCK AND BOND**
13 **RETURNS TO ESTIMATE AN EQUITY RISK PREMIUM.**

14 A. There are a number of flaws in using historical returns over long time periods to estimate
15 expected equity risk premiums. These issues include:

- 16 (A) Biased historical bond returns;
- 17 (B) The arithmetic versus the geometric mean return;
- 18 (C) Unattainable and biased historical stock returns;
- 19 (D) Survivorship bias;
- 20 (E) The “Peso Problem;”

1 (F) Market conditions today are significantly different than the past; and

2 (G) Changes in risk and return in the markets.

3 These issues will be addressed in order.

4 **Biased Historical Bond Returns**

5 **Q. HOW ARE HISTORICAL BOND RETURNS BIASED?**

6 A. An essential assumption of these studies is that over long periods of time investors'
7 expectations are realized. However, the experienced returns of bondholders in the past violate this
8 critical assumption. Historical bond returns are biased downward as a measure of expectancy
9 because of capital losses suffered by bondholders in the past. As such, risk premiums derived from
10 this data are biased upwards.

11 **The Arithmetic versus the Geometric Mean Return**

12 **Q. PLEASE DISCUSS THE ISSUE RELATING TO THE USE OF THE ARITHMETIC**
13 **VERSUS THE GEOMETRIC MEAN RETURNS IN THE IBBOTSON METHODOLOGY.**

14 A. The measure of investment return has a significant effect on the interpretation of the risk
15 premium results. When analyzing a single security price series over time (i.e., a time series), the
16 best measure of investment performance is the geometric mean return. Using the arithmetic
17 mean overstates the return experienced by investors. In a study entitled "Risk and Return on
18 Equity: The Use and Misuse of Historical Estimates," Carleton and Lakonishok make the
19 following observation: "The geometric mean measures the changes in wealth over more than one

period on a buy and hold (with dividends invested) strategy.”²⁴ Since Ms. Ahern’s study covers more than one period (and she assumes that dividends are reinvested), she should be employing the geometric mean and not the arithmetic mean.

Q. PLEASE PROVIDE AN EXAMPLE DEMONSTRATING THE PROBLEM WITH USING THE ARITHMETIC MEAN RETURN.

A. To demonstrate the upward bias of the arithmetic mean, consider the following example. Assume that you have a stock (that pays no dividend) that is selling for \$100 today, increases to \$200 in one year, and then falls back to \$100 in two years. The table below shows the prices and returns.

Time Period	Stock Price	Annual Return
0	\$100	
1	\$200	100%
2	\$100	-50%

The arithmetic mean return is simply $(100\% + (-50\%))/2 = 25\%$ per year. The geometric mean return is $((2 * .50)^{(1/2)}) - 1 = 0\%$ per year. Therefore, the arithmetic mean return suggests that your stock has appreciated at an annual rate of 25%, while the geometric mean return indicates an annual return of 0%. Since after two years, your stock is still only worth \$100, the geometric mean return is the appropriate return measure. For this reason, when stock returns and earnings growth

²⁴ Willard T. Carleton and Josef Lakonishok, “Risk and Return on Equity: The Use and Misuse of Historical Estimates,” *Financial Analysts Journal* (January-February, 1985), pp. 38-47.

1 rates are reported in the financial press, they are generally reported using the geometric mean. This
2 is because of the upward bias of the arithmetic mean. Therefore, Ms. Ahern's arithmetic mean
3 return measures are biased and should be disregarded.

4 **Unattainable and Biased historical Stock Returns**

5 **Q. YOU NOTE THAT HISTORICAL STOCK RETURNS ARE BIASED USING THE**
6 **IBBOTSON METHODOLOGY. PLEASE ELABORATE.**

7 A. Returns developed using Ibbotson's methodology are computed on stock indexes and
8 therefore (1) cannot be reflective of expectations because these returns are unattainable to investors,
9 and (2) produce biased results. This methodology assumes (a) monthly portfolio rebalancing and
10 (b) reinvestment of interest and dividends. Monthly portfolio rebalancing presumes that investors
11 rebalance their portfolios at the end of each month in order to have an equal dollar amount invested
12 in each security at the beginning of each month. The assumption would obviously generate
13 extremely high transaction costs and, as such, these returns are unattainable to investors. In addition,
14 an academic study demonstrates that the monthly portfolio rebalancing assumption produces biased
15 estimates of stock returns.²⁵

16 Transaction costs themselves provide another bias in historical versus expected returns. The
17 observed stock returns of the past were not the realized returns of investors due to the much higher
18 transaction costs of previous decades. These higher transaction costs are reflected through the

²⁵ See Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics* (1983), pp. 371-86.

1 higher commissions on stock trades, and the lack of low cost mutual funds like index funds.

2 **Survivorship Bias**

3 **Q. HOW DOES SURVIVORSHIP BIAS TAINT MS. AHERN'S HISTORICAL**
4 **EQUITY RISK PREMIUM?**

5 A. Using historical data to estimate an equity risk premium suffers from survivorship bias.
6 Survivorship bias results when using returns from indexes like the S&P 500. The S&P 500 includes
7 only companies that have survived. The fact that returns of firms that did not perform so well were
8 dropped from these indexes is not reflected. Therefore these stock returns are upwardly biased
9 because they only reflect the returns from more successful companies.

10 **The "Peso Problem"**

11 **Q. WHAT IS THE "PESO PROBLEM" AND HOW DOES IT AFFECT historical**
12 **RETURNS AND EQUITY RISK PREMIUMS?**

13 A. Ms. Ahern's use of historical return data also suffers from the so-called "peso problem."
14 The 'peso problem' issue was first highlighted by the Nobel laureate, Milton Friedman, and gets its
15 name from conditions related to the Mexican peso market in the early 1970s. This issue involves the
16 fact that past stock market returns were higher than were expected at the time because despite war,
17 depression, and other social, political, and economic events, the US economy survived and did not
18 suffer hyperinflation, invasion, and the calamities of other countries. As such, highly improbable
19 events, which may or may not occur in the future, are factored into stock prices, leading to

1 seemingly low valuations. Higher than expected stock returns are then earned when these events do
2 not subsequently occur. Therefore, the 'peso problem' indicates that historical stock returns are
3 overstated as measures of expected returns.

4 **Market Conditions Today are Significantly Different than in the Past**

5 **Q. FROM AN EQUITY RISK PREMIUM PERSPECTIVE, PLEASE DISCUSS HOW**
6 **MARKET CONDITIONS ARE DIFFERENT TODAY.**

7 A. The equity risk premium is based on expectations of the future. When past market
8 conditions vary significantly from the present, historical data does not provide a realistic or
9 accurate barometer of expectations of the future. As noted previously, stock valuations (as
10 measured by P/E) are relatively high and interest rates are relatively low, on a historical basis.
11 Therefore, given the high stock prices and low interest rates, expected returns are likely to be
12 lower on a going forward basis. Consistent with this observation, the financial forecasters in the
13 Federal Reserve Bank of Philadelphia survey expect a market return of 7.00% over the next ten
14 years.

15 **Changes in Risk and Return in the Markets**

16 **Q. PLEASE DISCUSS THE NOTION THAT HISTORICAL EQUITY RISK PREMIUM**
17 **STUDIES DO NOT REFLECT THE CHANGE IN RISK AND RETURN IN TODAY'S**
18 **FINANCIAL MARKETS.**

19 A. The historical equity risk premium methodology is unrealistic in that it makes the explicit
20 assumption that risk premiums do not change over time based on market conditions such as

1 inflation, interest rates, and expected economic growth. Furthermore, using historical returns to
2 measure the equity risk premium masks the dramatic change in the risk and return relationship
3 between stocks and bonds. The nature of the change is that bonds have increased in risk relative to
4 stocks. This change suggests that the equity risk premium has declined in recent years.

5 Page 1 of Exhibit_(JRW-10) provides the yields on long-term U.S. Treasury bonds from
6 1926 to 2005. One very obvious observation from this graph is that interest rates increased
7 dramatically from the mid-1960s until the early 1980s, and since have returned to their 1960
8 levels. The annual market risk premiums for the 1926 to 2005 period are provided on page 2 of
9 Exhibit_(JRW-10). The annual market risk premium is defined as the return on common stock
10 minus the return on long-term Treasury Bonds. There is considerable variability in this series
11 and a clear decline in recent decades. The high was 54% in 1933 and the low was -38% in 1931.
12 Evidence of a change in the relative riskiness of bonds and stocks is provided on page 3 of
13 Exhibit_(JRW-10) which plots the standard deviation of monthly stock and bond returns since
14 1930. The plot shows that, whereas stock returns were much more volatile than bond returns
15 from the 1930s to the 1970s, bond returns became more variable than stock returns during the
16 1980s. In recent years stocks and bonds have become much more similar in terms of volatility,
17 but stocks are still a little more volatile. The decrease in the volatility of stocks relative to bonds
18 over time has been attributed to several stock related factors: the impact of technology on
19 productivity and the new economy; the role of information (see former Federal Reserve
20 Chairman Greenspan's comments referred to earlier in this testimony) on the economy and

1 markets; better cost and risk management by businesses; and several bond related factors;
2 deregulation of the financial system; inflation fears and interest rates; and the increase in the use
3 of debt financing. Further evidence of the greater relative riskiness of bonds is shown on page 4
4 of Exhibit_(JRW-10), which plots real interest rates (the nominal interest rate minus inflation)
5 from 1926 to 2005. Real rates have been well above historical norms during the past 10-15
6 years. These high real interest rates reflect the fact that investors view bonds as riskier
7 investments.

8 The net effect of the change in risk and return has been a significant decrease in the return
9 premium that stock investors require over bond yields. In short, the equity or market risk premium
10 has declined in recent years. This decline has been discovered in studies by leading academic
11 scholars and investment firms, and has been acknowledged by government regulators. As such,
12 using a historical equity risk premium analysis is simply outdated and not reflective of current
13 investor expectations and investment fundamentals.

14 **Q. DO YOU HAVE ANY OTHER THOUGHTS ON THE USE OF HISTORICAL**
15 **RETURN DATA TO ESTIMATE AN EQUITY RISK PREMIUM?**

16 A. Yes. Jay Ritter, a Professor of Finance at the University of Florida, identified the use of
17 historical stock and bond return data to estimate a forward-looking equity risk premium as one of
18 the “Biggest Mistakes” taught by the finance profession.²⁶ His argument is based on the theory
19 behind the equity risk premium, the excessive results produced by historical returns, and the

²⁶ Jay Ritter, “The Biggest Mistakes We Teach,” Journal of Financial Research (Summer 2002).

previously-discussed errors of such as survivorship bias in historical data.

Q. PLEASE SUMMARIZE YOUR ASSESSMENT OF MS. AHERN'S RISK PREMIUM ANALYSES.

A. Ms. Ahern's risk premium studies are flawed and exaggerate the expected risk premium of investors. As shown in Exhibit_(JRW-9), *Value Line*'s forecasted market return is upwardly biased and therefore overstates the equity risk premium. And the use of historical returns to estimate an expected equity risk premium is subject to a myriad of empirical biases that prevents such risk premiums from being reasonable expectations of the expected risk premium. Hence, Ms. Ahern's risk premium analyses are erroneous and should be disregarded in estimating Tega Cay' equity cost rate.

Q. PLEASE ASSESS MS. AHERN'S USE OF THE CAPITAL ASSET PRICING MODEL.

A. In Schedule PMA-11 Ms. Ahern uses applies the CAPM and a variant, the Empirical CAPM (ECAPM), to the two groups of water utility companies. Her results are summarized below:

CAPM Results

	<u>Seven AUS Water Companies</u>	<u>Four Value Line Water Companies</u>
Risk-Free Rate	5.4%	5.4%
Average Beta	.70	.74
Equity Risk Premium	6.9%	6.9%
CAPM Equity Cost Rate	10.2%	10.5%

ECAPM Results

	<u>Seven AUS Water Companies</u>	<u>Four Value Line Water Companies</u>
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Risk-Free Rate	5.4%	5.4%
Average Beta	.70	.74
Equity Risk Premium	5.3%	5.5%
ECAPM Equity Cost Rate	10.7%	10.9%

Ms. Ahern then averages the results for the CAPM and ECAPM to provide CAPM results of 10.3% for both the seven- and four- company water utility groups.

Q. WHAT CONCERNS DO YOU HAVE WITH MS. AHERN'S CAPM AND ECAPM ANALYSES?

A. I have two concerns with Ms. Ahern's CAPM/ECAPM analyses: (1) her use of the so-called ECAPM, and (2) most significantly, her equity or market risk premium.

Q. WHAT ISSUES DO YOU HAVE WITH MS. AHERN'S ECAPM?

A. Ms. Ahern has employed not only a traditional CAPM, but also the so-called ECAPM. In support of her ECAPM, Ms. Ahern cites a book by Dr. Roger Morin. Dr. Morin's book provides anecdotal evidence on the ECAPM and the weights to be used in applying the ECAPM. However, Dr. Morin's book does not develop or empirically test the ECAPM. In addition, the results presented in Dr. Morin's book do not necessarily support the ECAPM used by Ms. Ahern. For example, Dr. Morin's results are also consistent with a declining equity risk premium over time.

Q. YOUR SECOND ISSUE WITH MS. AHERN'S CAPM/ECAPM INVOLVES THE EQUITY RISK PREMIUM. WHAT IS YOUR CONCERN ON THIS MATTER?

A. The primary problem with both Ms. Ahern's CAPM and ECAPM is the equity risk premium. Ms. Ahern has employed a 6.9% equity or market risk premium. She computes this

1 equity or market risk premium as the average of the results of historical and projected equity risk
2 studies. She computes a historical risk premium as the difference between the historical stock and
3 bond returns over the 1926 and 2005 period as derived by Ibbotson Associates. She calculates the
4 forecasted equity risk premium as the difference between the *Value Line* projected overall stock
5 market return and the forecasted risk-free bond rate.

6 The methodology Ms. Ahern employs to compute her equity risk premium of 6.9% is
7 virtually the same that she used in her risk premium study. Hence, the extended discussion above
8 that highlights the problems and biases of using (1) the *Value Line* forecasted equity risk premium
9 and (2) the Ibbotson historical return approach, applies here to both her CAPM/ECAPM equity risk
10 premiums. In general, both *Value Line*'s forecasted market return as well as historical returns
11 produce overstated estimates of the expected equity risk premium.

12 **Q. PLEASE SUMMARIZE MS. AHERN'S RISK PREMIUM STUDIES IN LIGHT OF**
13 **THE EVIDENCE ON RISK PREMIUMS IN TODAY'S MARKETS.**

14 A. The primary issue in both her risk premium and CAPM analyses is the magnitude of the
15 equity or market risk premium. Ms. Ahern's risk premium estimates should be ignored because
16 they are totally out of line with the equity risk premium estimates discovered in recent academic
17 studies by leading finance scholars and employed by leading investment banks, management
18 consulting firms, financial forecasters and corporate CFOs. In both her risk premium and CAPM
19 studies, a more realistic market risk premium is in the 4.0 percent range above Treasury yields.
20 Furthermore, even former Federal Reserve Chairman Greenspan believes that the equity risk

1 premium has declined.

2 **Q. PLEASE DISCUSS MS. AHERN'S COMPARABLE EARNINGS ANALYSIS.**

3 A. Ms. Ahern also estimates an equity cost rate for Tega Cay employing the CE approach. Her
4 methodology involves averaging prospective returns on common equity for two proxy groups of
5 non-utility companies "comparable" in risk to her proxy groups of seven and four water utility
6 companies as determined from screening *Value Line's* Value Screen database. In Schedule PMA-12,
7 Ms. Ahern provides lists of the ninety-nine and one hundred 'comparable' companies to the two
8 groups of water companies. The averages of the historic and projected returns on common equity for
9 the two groups are 16.1% and 16.0%.

10 This approach is fundamentally flawed for several reasons. Ms. Ahern has not performed
11 any analysis to examine whether her return on equity figures are likely measures of long-term
12 earnings expectations. More importantly, however, since Ms. Ahern has not evaluated the
13 market-to-book ratios for these companies, she cannot indicate whether the past and projected
14 returns on common equity are above or below investors' requirements.²⁷ For example, her list of
15 'comparable' companies includes Del Monte Foods and Fischer Scientific. These companies
16 have returns on equity of 51.3% and 69.6% and sell at market prices that are in excess of 5 times
17 book value per share. Even Ms. Ahern would not suggest that these companies have equity cost
18 rates that are as high as their returns on common equity.

²⁷ The relationship between return on equity, cost of equity, and market-to-book ratios is discussed on page 11 of my testimony. These principles have no bearing or relation to Ms. Ahern's discussion on pages 25-30 of her testimony regarding the application of a DCF equity cost rate to book value versus a market value capitalization.

1 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

2 **A. Yes it does.**

APPENDIX A

EDUCATIONAL BACKGROUND, RESEARCH, AND RELATED BUSINESS EXPERIENCE

J. RANDALL WOOLRIDGE

J. Randall Woolridge is a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal Endowed Faculty Fellow in Business Administration in the College of Business Administration of the Pennsylvania State University in University Park, PA. In addition, Professor Woolridge is Director of the Smeal College Trading Room and President and CEO of the Nittany Lion Fund, LLC. He is also a Vice President of the Columbia Group, a public utility consulting firm based in Georgetown, CT, and serves on the Investment Committee of ARIS Corporation, an asset management firm based in State College, PA.

Professor Woolridge received a Bachelor of Arts degree in Economics from the University of North Carolina, a Master of Business Administration degree from the Pennsylvania State University, and a Doctor of Philosophy degree in Business Administration (major area-finance, minor area-statistics) from the University of Iowa. At Iowa he received a Graduate Fellowship and was awarded membership in Beta Gamma Sigma, a national business honorary society. He has taught Finance courses at the University of Iowa, Cornell College, and the University of Pittsburgh, as well as the Pennsylvania State University. These courses include corporation finance, commercial and investment banking, and investments at the undergraduate, graduate, and executive MBA levels.

Professor Woolridge's research has centered on the theoretical and empirical foundations of corporation finance and financial markets and institutions. He has published over 25 articles in the best academic and professional journals in the field, including the *Journal of Finance*, the *Journal of Financial Economics*, and the *Harvard Business Review*. His research has been cited extensively in the business press. His work has been featured in the *New York Times*, *Forbes*, *Fortune*, *The Economist*, *Financial World*, *Barron's*, *Wall Street Journal*, *Business Week*, *Washington Post*, *Investors' Business Daily*, *Worth Magazine*, *USA Today*, and other publications. In addition, Dr. Woolridge has appeared as a guest on CNN's *Money Line* and CNBC's *Morning Call* and *Business Today*.

The second edition of Professor Woolridge's popular stock valuation book, *The StreetSmart Guide to Valuing a Stock* (McGraw-Hill, 2003), was recently released. He has also co-authored *Spinoffs and Equity Carve-Outs: Achieving Faster Growth and Better Performance* (Financial Executives Research Foundation, 1999) as well as a new textbook entitled *Modern Corporate Finance, Capital Markets, and Valuation* (Kendall Hunt, 2003). Dr. Woolridge is a founder and a managing director of www.valuepro.net - a stock valuation website.

Professor Woolridge has also consulted with and prepared research reports for major corporations, financial institutions, and investment banking firms, and government agencies. In addition, he has directed and participated in over 500 university- and company- sponsored professional development programs for executives in 25 countries in North and South America, Europe, Asia, and Africa.

Dr. Woolridge has prepared testimony and/or provided consultation services in the following cases:

Pennsylvania: Dr. Woolridge has prepared testimony on behalf of the Pennsylvania Office of Consumer Advocate in the following cases before the Pennsylvania Public Utility Commission:

Bell Telephone Company (R-811819), Peoples Natural Gas Company (R-832315), Pennsylvania Power Company (R-832409), Western Pennsylvania Water Company (R-832381), Pennsylvania Power Company (R-842740), Pennsylvania Gas and Water Company (R-850178), Metropolitan Edison Company (R-860384), Pennsylvania Electric Company (R-860413), North Penn Gas Company (R-860535), Philadelphia Electric Company (R-870629), Western Pennsylvania Water Company (R-870825), York Water Company (R-870749), Pennsylvania-American Water Company (R-880916), Equitable Gas Company (R-880971), the Bloomsburg Water Co. (R-891494), Columbia Gas of Pennsylvania, Inc. (R-891468), Pennsylvania-American Water Company (R-90562), Breezewood Telephone Company (R-901666), York Water Company (R-901813), Columbia Gas of Pennsylvania, Inc. (R-901873), National Fuel Electric utility Company (R-911912), Pennsylvania-American Water Company (R-911909), Borough of Media Water Fund (R-912150), UGI Utilities, Inc. - Electric Utility Division (R-922195), Dauphin Consolidated Water Supply Company - General Waterworks of Pennsylvania, Inc. (R-932604), National Fuel Electric utility Company (R-932548), Commonwealth Telephone Company (I-920020), Conestoga Telephone and Telegraph Company (I-920015), Peoples Natural Gas Company (R-932866), Blue Mountain Consolidated Water Company (R-932873), National Fuel Gas Company (R-942991), UGI - Gas Division (R-953297), UGI - Electric Division (R-953534), Pennsylvania-American Water Company (R-973944), Pennsylvania-American Water Company (R-994638), Philadelphia Suburban Water Company (R-994868;R-994877;R-994878; R-9948790), Philadelphia Suburban Water Company (R-994868), Wellsboro Electric Company (R-00016356), Philadelphia Suburban Water Company (R-00016750), National Fuel Electric utility Company (R-00038168), Pennsylvania-American Water Company (R-00038304), York Water Company (R-00049165), Valley Energy Company (R-00049345), Wellsboro Electric Company (R-00049313), and National Fuel Gas utility Corporation (R-00049656).

New Jersey: Dr. Woolridge prepared testimony for the New Jersey Department of the Public Advocate, Division of Rate Counsel: New Jersey-American Water Company (R-91081399J), New Jersey-American Water Company (R-92090908J), and Environmental Disposal Corp (R-94070319).

Hawaii: Dr. Woolridge prepared testimony for the Hawaii Office of the Consumer Advocate: East Honolulu Community Services, Inc. (Docket No. 7718).

Delaware: Dr. Woolridge prepared testimony for the Delaware Division of Public Advocate: Artesian Water Company (R-00-649).

Ohio: Dr. Woolridge prepared testimony for the Ohio Office of Consumers' Council: SBC Ohio (Case No. 02-1280-TP-UNC R-00-649), and Cincinnati Gas & Electric Company (Case No. 05-0059-EL-AIR).

New York: Dr. Woolridge prepared testimony for the County of Nassau in New York State: Long Island Lighting Company (PSC Case No. 942354).

Florida: Dr. Woolridge prepared testimony for the Office of Peoples Counsel in Florida: Florida Power & Light Co. (Docket No. 050045-EL).

Connecticut: Dr. Woolridge prepared testimony for the Office of Consumer Counsel in Connecticut: United Illuminating (Docket No. 96-03-29), Yankee Gas Company (Docket No. 04-06-01), Southern Connecticut Gas Company (Docket No. 03-03-17), the United Illuminating Company (Docket No. 05-06-04).

California: Dr. Woolridge prepared testimony for the Office of Ratepayer Advocate in California: San Gabriel Valley Water Company (Docket No. 05-08-021).

South Carolina: Dr. Woolridge prepared testimony for the Office of Regulatory Staff in South Carolina: South Carolina Electric and Gas Company (Docket No. 2005-113-G).

Kentucky: Dr. Woolridge prepared testimony for the Office of Attorney General in Kentucky: Kentucky-American Water Company (Case No. 2004-00103), Union Heat, Light, and Power Company (Case No. 2004-00042), and Kentucky Power Company (Case No. 2005-00341).

Washington, D.C.: Dr. Woolridge prepared testimony for the Office of the People's Counsel in the District of Columbia: Potomac Electric Power Company (Formal Case No. 939).

Washington: Dr. Woolridge consulted with trial staff of the Washington Utilities and Transportation Commission on the following cases: Puget Energy Corp. (Docket Nos. UE-011570 and UG-011571); and Avista Corporation (Docket No. UE-011514).

Kansas: Dr. Woolridge prepared testimony on behalf of the Kansas Citizens' Utility Ratepayer Board Utilities in the following cases: Western Resources Inc. (Docket No. 01-WSRE-949-GIE), UtiliCorp (Docket No. 02-UTCG701-CIG), and westar Energy, Inc. (Docket No. 05-WSEE-981-RTS).

FERC: Dr. Woolridge has prepared testimony on behalf of the Pennsylvania Office of Consumer Advocate in the following cases before the Federal Energy Regulatory Commission: National Fuel Gas Supply Corporation (RP-92-73-000) and Columbia Gulf Transmission Company (RP97-52-000).

Vermont: Dr. Woolridge prepared testimony for the Department of Public Service in the Central Vermont Public Service Case (Docket No. 6988).

Exhibit_(JRW-1)

Tega Cay Water Service, Inc.
Cost of Capital

ROE = 9.00%

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	59.10%	6.42%	3.79%
Common Equity	40.90%	9.00%	3.68%
Total	100.00%		7.48%

Coverage Ratios

Tega Cay Water Service, Inc.		
Before-income tax coverage if interest expense based on an effective federal and state tax income tax rate of	38.25%	2.57 X
After-income tax coverage of interest expense		1.97 X

ROE = 9.40%

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	59.10%	6.42%	3.79%
Common Equity	40.90%	9.40%	3.84%
Total	100.00%		7.64%

Coverage Ratios

Tega Cay Water Service, Inc.		
Before-income tax coverage if interest expense based on an effective federal and state tax income tax rate of	38.25%	2.64 X
After-income tax coverage of interest expense		2.01 X

**The Impact of the 2003 Tax Legislation
On the Cost of Equity Capital**

On May 28, 2003, President Bush signed the *Jobs and Growth Tax Relief Reconciliation Act of 2003*. The primary purpose of this legislation was to reduce taxes to enhance economic growth. A primary component of the new tax law was a significant reduction in the taxation of corporate dividends for individuals. Dividends have been described as “double-taxed.” First, corporations pay taxes on the income they earn before they pay dividends to investors, then investors pay taxes on the dividends that they receive from corporations. One of the implications of the double taxation of dividends is that, all else equal, it results in a high cost of raising capital for corporations.

The new tax legislation reduces the double taxation of dividends by lowering the tax rate on dividends from the 30 percent range (the average tax bracket for individuals) to 15 percent. This reduction in the taxation of dividends for individuals enhances their after-tax returns and thereby reduces their pre-tax required returns. This reduction in pre-tax required returns (due to the lower tax on dividends) effectively reduces the cost of equity capital for companies. The new tax law also reduced the tax rate on long-term capital gains from 20% to 15%.

To demonstrate the effect of the new legislation, assume that a utility has a 10% expected return — 5.0% in dividends and 5.0% in capital gains. The new tax law reduces the double-taxation by reducing the tax rate on dividends from the 30 percent range (the marginal tax bracket for the average individual taxpayer) to 15 percent. The table below

illustrates the effect of the new tax law. Panel A shows that under the old tax law a 10.0% pre-tax return provided for a 7.5% after tax return. Panel B shows that under the new tax law, with tax rates of 15% on both dividends and capital gains, the 10% pre-tax return is worth 8.5% on an after-tax basis. In Panel C, I have held the after-tax return constant (at 7.5%) to illustrate the effect of the new tax law on required pre-tax returns. Assuming that the entire after-tax 1% return difference (7.5% to 8.5%) is attributed to the lower taxation of dividends, the 10.0% pre-tax return under the new law is now only 8.82%. In other words, to generate an after-tax return of 7.5%, the new tax law reduced the required pre-tax return from 10.0% to 8.82%.

The Impact of the New Tax Law on Pre- and After- Tax Returns

Panel A
Old Tax Law
10% Pre-Tax Return - 5% Dividend Yield & 5% Capital Gain
Tax Rates - Dividends 30% & Capital Gains 20%

	Pre-Tax Return	Tax Rate	After-Tax Return
Dividends	5.00%	30.00%	3.50%
Capital Gain	5.00%	20.00%	4.00%
Total	10.00%		7.50%

Panel B
New Tax Law
10% Pre-Tax Return - 5% Dividend Yield & 5% Capital Gain
Tax Rates - Dividends 15% & Capital Gains 15%

	Pre-Tax Return	Tax Rate	After-Tax Return
Dividends	5.00%	15.00%	4.25%
Capital Gain	5.00%	15.00%	4.25%
Total	10.00%		8.50%

Panel C
The Effect of the New Tax Law on Pre-Tax Returns
7.50% After-Tax Return - 3.25% Dividend Yield & 4.25% Capital Gain
Tax Rates - Dividends 15% & Capital Gains 15%

	Pre-Tax Return	Tax Rate	After-Tax Return
Dividends	3.82%	15.00%	3.25%
Capital Gain	5.00%	15.00%	4.25%
Total	8.82%		7.50%

Exhibit_(JRW-3)
Tega Cay Water Service, Inc.

Summary Financial Statistics
Small Water Company Group

Company	S&P Bond Rating	Operating Revenue (\$mil)	Percent Water Revenue	Net Plant (\$mil)	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio*	Return on Equity	Price/ Earnings Ratio	Market to Book Ratio
Artesian Resources Corp.	NR	45.9	92%	192.6	1.74	DE	38.0	8.9%	24.9	219
Connecticut Water Services, Inc.	AA+	51.1	91%	303.1	1.78	CT	52.0	7.5%	29.0	213
Middlesex Water Company	A	76.1	89%	261.3	2.76	NJ, DE	43.0	8.9%	26.0	230
Pennichuck Corporation	NR	24.1	91%	78.1	2.79	NH, MA	52.0			195
York Water Company	NR	27.2	90%	142.1	3.74	PA	46.0	11.8%	33.6	385
Mean		44.9	91%	195.4	2.56		46.2	9.3%	28.4	248

*Based on total permanent capital

Data Sources: AUS Utility Reports, June, 2006. Interest coverage is computed using company data.

Summary Financial Statistics
Large Water Company Group

Company	S&P Bond Rating	Operating Revenue (\$mil)	Percent Water Revenue	Net Plant (\$mil)	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio*	Return on Equity	Price/ Earnings Ratio	Market to Book Ratio
American States Water	A-	247.0	86%	665.5	2.20	CA, AZ	47.0	11.1%	22.5	240
Aqua America, Inc.	AA-	500.7	88%	2007.2	3.80	PA, OH, NJ, IL, ME, NC, TX, FL, KY	43.0	11.0%	32.6	358
California Water Service Group	NR	325.6	95%	773.9	2.40	CA, WA, NM	52.0	9.5%	26.0	244
SJW Corp.	NR	180.5	97%	377.8	3.13	CA	58.0	12.1%	18.1	211
Mean		313.5	92%	956.1	2.88		50.0	10.9%	24.8	263

*Based on total permanent capital

Data Sources: AUS Utility Reports, June, 2006. Interest coverage is computed using company data.

Exhibit_(JRW-4)
Tega Cay Water Service, Inc.
Capital Structure Ratios

Tega Cay Proposed Capital Structure

Debt	59.10%
Common equity	40.90%
Average Totals	100.0%

Capital Structure - Small and Large Water Company Groups

Average Of All Companies Ratios	2006		2005		2005		2005		2004		2004		2004	
	1st Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Short-term debt	5.13%	4.28%	5.00%	6.04%	6.68%	6.73%	3.99%	3.38%	3.78%	2.56%	7.51%	7.01%	7.01%	7.01%
Current portion of long-term debt	1.58%	1.56%	1.47%	1.61%	3.78%	2.90%	3.38%	3.38%	3.78%	2.56%	2.90%	2.90%	2.90%	1.66%
Long-term debt	46.32%	45.25%	45.05%	45.79%	42.92%	44.53%	45.47%	45.47%	42.92%	44.53%	45.05%	45.05%	45.05%	46.21%
Common equity	46.96%	48.90%	48.48%	46.56%	46.62%	46.19%	47.15%	47.15%	46.62%	46.19%	44.54%	44.54%	44.54%	45.12%
Average Totals	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Average Ratios - Last Two Years

Short-term debt	5.82%
Current portion of long-term debt	2.28%
Long-term debt	45.18%
Common equity	46.73%
Average Totals	100.0%

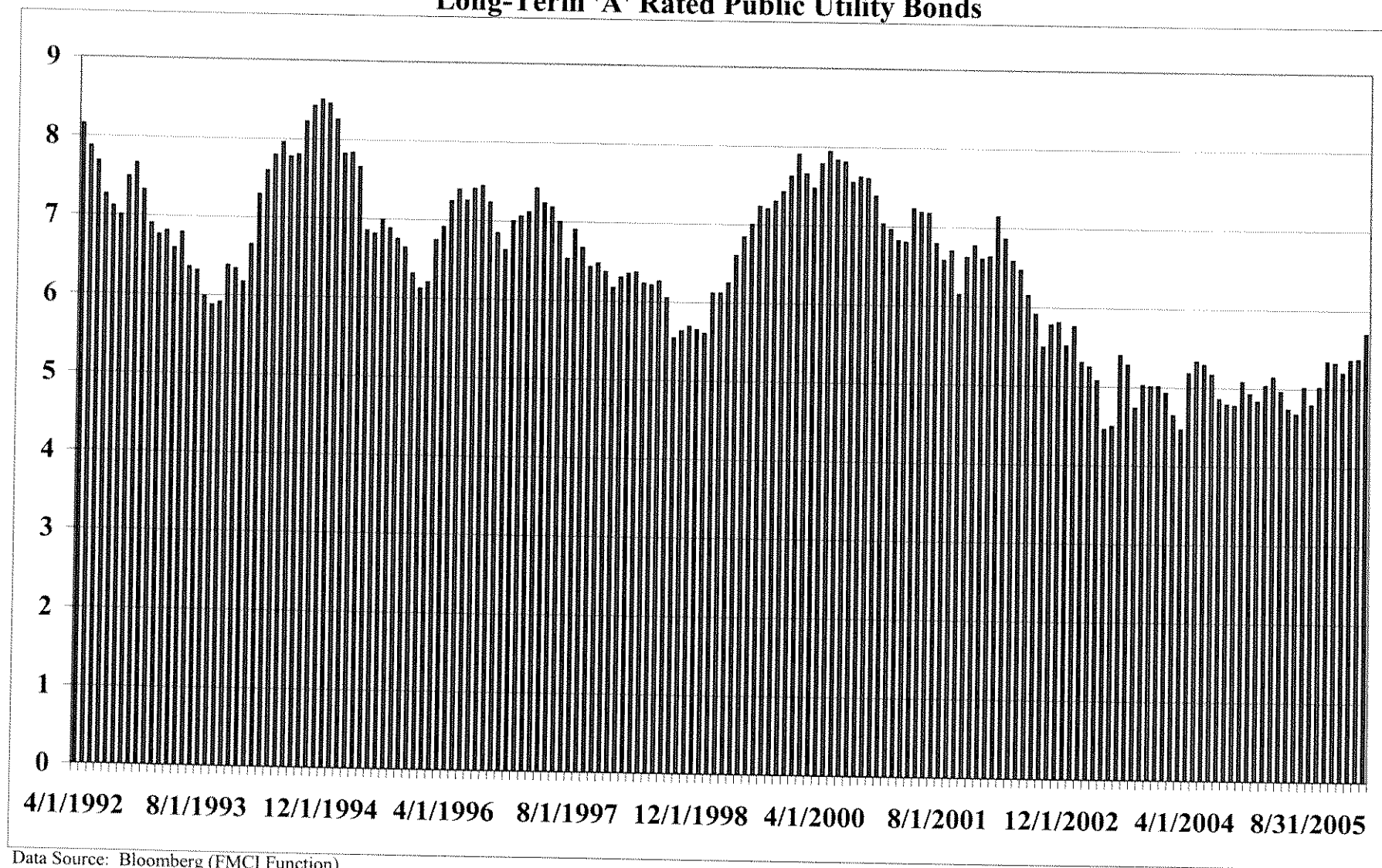
Data Source: Bloomberg

Average Debt and Equity Capital Structure

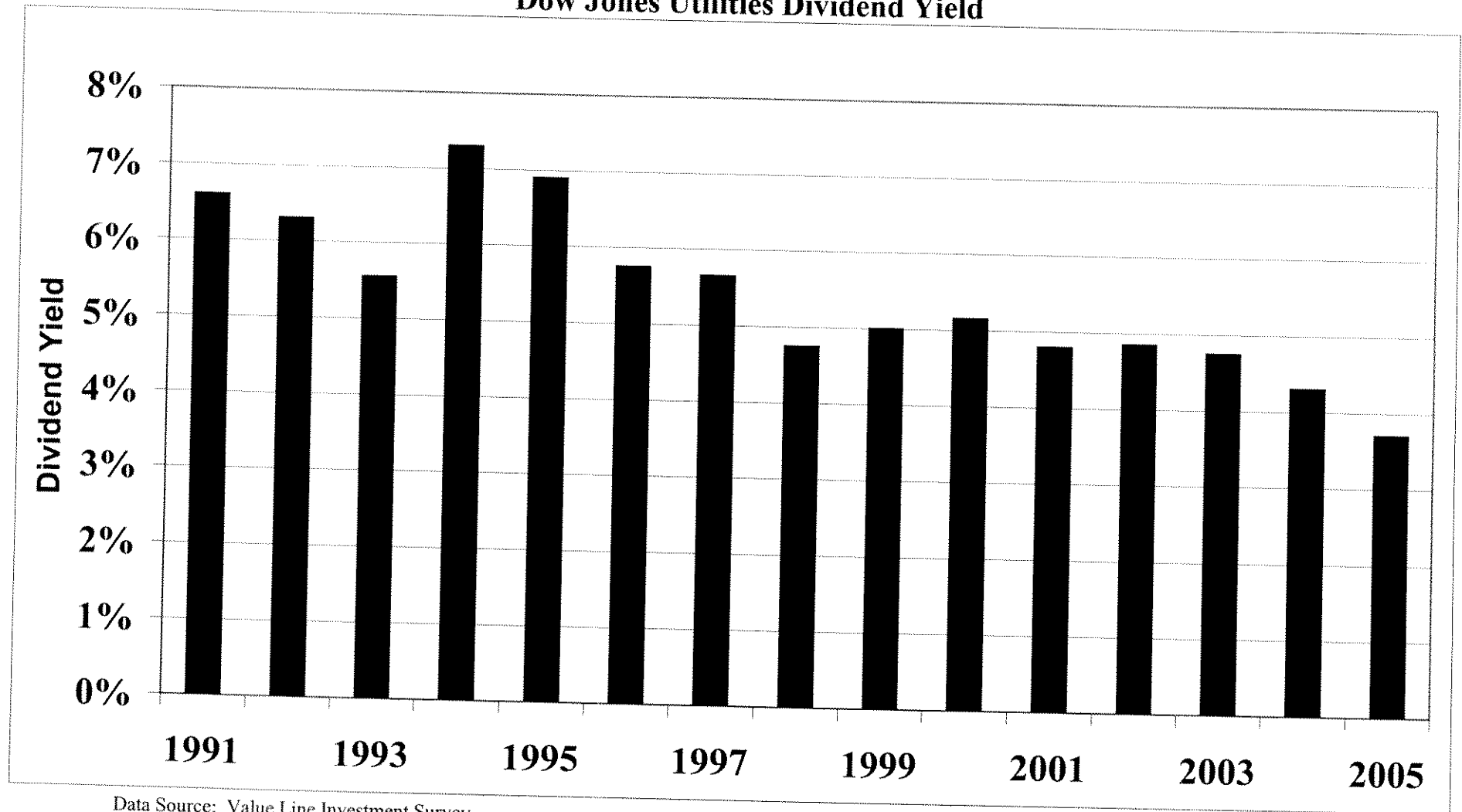
Debt	53.27%
Common equity	46.73%

Exhibit_(JRW-5)

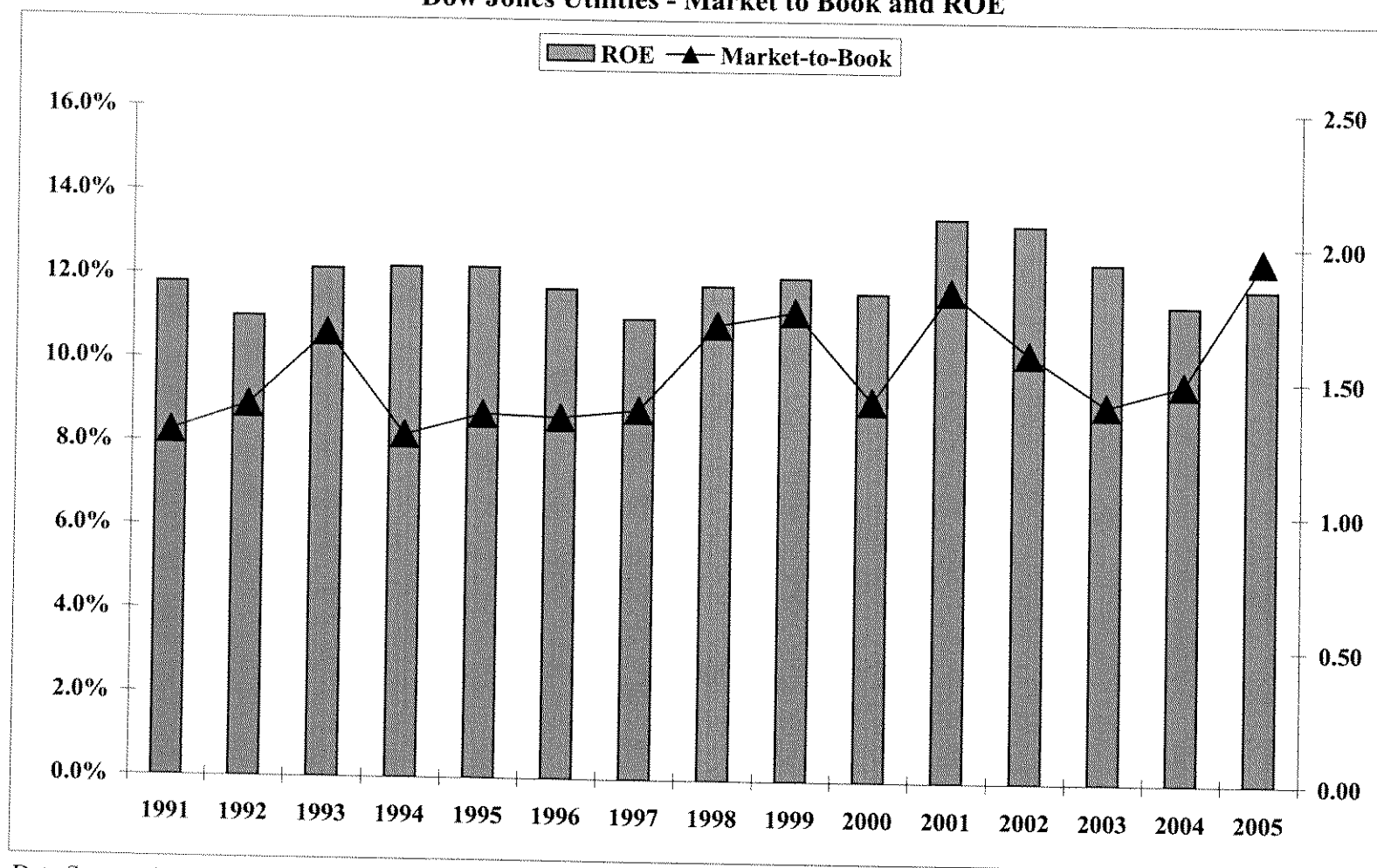
Long-Term 'A' Rated Public Utility Bonds



Exhibit_(JRW-5)
Dow Jones Utilities Dividend Yield



Exhibit_(JRW-5)
Dow Jones Utilities - Market to Book and ROE



Data Source: Value Line Investment Survey

Exhibit_(JRW-6)

Industry Average Betas

Industry Name	Number of Firms	Beta	Industry Name	Number of Firms	Beta	Industry Name	Number of Firms	Beta
E-Commerce	59	3.04	Manuf. Housing/RV	16	1.08	Paper/Forest Products	40	0.82
Semiconductor	121	2.97	Retail (Special Lines)	177	1.08	Hotel/Gaming	76	0.82
Semiconductor Equip	14	2.91	Medical Supplies	261	1.04	Diversified Co.	118	0.82
Internet	306	2.78	Foreign Electronics	11	1.03	Toiletries/Cosmetics	20	0.82
Telecom. Equipment	122	2.61	Metals & Mining (Div.)	77	1.03	Packaging & Container	37	0.82
Wireless Networking	66	2.60	Chemical (Basic)	18	1.03	Electric Util. (Central)	25	0.81
Entertainment Tech	32	2.47	Oilfield Svcs/Equip.	98	1.02	Pharmacy Services	15	0.81
Power	25	2.23	Shoe	22	1.02	Electric Utility (East)	29	0.80
Computers/Peripherals	138	2.23	Retail Store	46	0.99	Household Products	26	0.79
Computer Software/Svcs	395	2.06	Retail Automotive	14	0.98	Bank (Canadian)	7	0.76
Foreign Telecom.	20	1.88	Industrial Services	207	0.97	Environmental	91	0.76
Cable TV	22	1.82	Medical Services	184	0.96	Financial Svcs. (Div.)	244	0.75
Precision Instrument	104	1.81	Building Materials	45	0.96	Bank (Midwest)	39	0.75
Telecom. Services	146	1.69	Natural Gas (Div.)	36	0.96	Publishing	47	0.74
Electronics	175	1.65	Utility (Foreign)	5	0.95	Insurance (Life)	43	0.73
Biotechnology	87	1.63	Steel (General)	26	0.94	Investment Co.	21	0.73
Electrical Equipment	91	1.59	Homebuilding	34	0.92	Railroad	18	0.73
Drug	306	1.59	Coal	12	0.92	Maritime	39	0.72
Advertising	34	1.56	Furn/Home Furnishings	36	0.92	Canadian Energy	11	0.72
Bank (Foreign)	4	1.51	Electric Utility (West)	15	0.90	Cement & Aggregates	12	0.71
Entertainment	86	1.47	Chemical (Specialty)	92	0.90	Natural Gas (Distrib.)	29	0.70
Air Transport	45	1.40	Apparel	60	0.90	Insurance (Prop/Cas.)	84	0.70
Healthcare Information	35	1.38	Petroleum (Integrated)	30	0.90	Restaurant	82	0.68
Securities Brokerage	31	1.36	Retail Building Supply	10	0.89	R.E.I.T.	122	0.67
Human Resources	30	1.26	Metal Fabricating	41	0.88	Petroleum (Producing)	148	0.67
Investment Co.(Foreign)	15	1.26	Trucking	37	0.88	Precious Metals	62	0.67
Auto & Truck	29	1.23	Information Services	36	0.86	Tobacco	11	0.66
Auto Parts	58	1.22	Home Appliance	15	0.86	Water Utility	16	0.64
Tire & Rubber	13	1.19	Grocery	23	0.86	Food Processing	110	0.61
Steel (Integrated)	14	1.14	Newspaper	19	0.86	Beverage (Soft Drink)	19	0.61
Office Equip/Supplies	27	1.10	Aerospace/Defense	70	0.84	Food Wholesalers	21	0.60
Educational Services	38	1.09	Chemical (Diversified)	33	0.84	Beverage (Alcoholic)	22	0.56
Recreation	74	1.08	Machinery	134	0.83	Bank	487	0.55
						Thrift	221	0.49
						Market	7113	1.15

Data Source: <http://pages.stern.nyu.edu/~adamodar/>

Exhibit_(JRW-7)

**Tega Cay Water Service, Inc.
Discounted Cash Flow Analysis**

Small Water Company Group

Dividend Yield*	3.30%
Adjustment Factor	<u>1.03</u>
Adjusted Dividend Yield	3.40%
Growth Rate**	<u>6.00%</u>
Equity Cost Rate	9.40%

* Page 2 of Exhibit_(JRW-7)

** Based on data provided on pages 3-5,
Exhibit_(JRW-7)

Large Water Company Group

Dividend Yield*	2.55%
Adjustment Factor	<u>1.0325</u>
Adjusted Dividend Yield	2.63%
Growth Rate**	<u>6.50%</u>
Equity Cost Rate	9.13%

* Page 2 of Exhibit_(JRW-7)

** Based on data provided on pages 3-5,
Exhibit_(JRW-7)

**Tega Cay Water Service, Inc.
DCF Monthly Dividend Yields**

**Small Water Company Group
February 2005 - July 2006**

Company	Feb	Mar	Apr	May	Jun	Jul	Mean
Artesian Resources Corp.	3.0%	3.0%	2.9%	2.9%	2.9%	3.2%	3.0%
Connecticut Water Services, Inc.	3.5%	3.4%	3.4%	3.2%	3.5%	4.1%	3.5%
Middlesex Water Company	3.7%	3.7%	3.8%	3.7%	3.5%	4.0%	3.7%
Pennichuck Corporation	3.0%	2.7%	2.8%	2.8%	2.5%	3.4%	2.9%
York Water Company	2.5%	2.5%	2.5%	2.5%	2.4%	2.7%	2.5%
Mean	3.1%	3.1%	3.1%	3.0%	3.0%	3.5%	3.1%

**Monthly Dividend Yields
Large Water Company Group
February 2005 - July 2006**

Company	Feb	Mar	Apr	May	Jun	Jul	Mean
American States Water	2.8%	2.7%	2.5%	2.4%	2.4%	2.7%	2.6%
Aqua America, Inc.	1.5%	1.5%	1.6%	1.7%	1.9%	2.0%	1.7%
California Water Service Group	2.9%	2.8%	2.7%	2.7%	3.0%	3.4%	2.9%
SJW Corp.	2.2%	2.2%	2.2%	2.4%	2.5%	2.5%	2.3%
Mean	2.4%	2.3%	2.3%	2.3%	2.5%	2.7%	2.4%

Data Source: AUS Utility Reports, monthly issues.

Exhibit_(JRW-7)
Tega Cay Water Service, Inc.
DCF Equity Cost Growth Rate Measures
Historic Growth Rates

Small Water Company

Growth Rates	3 Year	5 Year	10 Year
ARTN B - Sales	9.389%	10.449%	7.183%
CTWS - Sales	1.167%	2.711%	1.890%
MSEX - Sales	6.406%	6.493%	7.023%
PNNW - Sales	0.496%	0.085%	7.545%
YORW - Sales	11.088%	7.720%	5.665%
Average	5.709%	5.492%	5.861%
Median	6.406%	6.493%	7.023%
ARTN B - EPS	2.287%	9.359%	5.953%
CTWS - EPS	4.004%	3.004%	2.790%
MSEX - EPS	-0.808%	7.052%	0.573%
PNNW - EPS	-48.825%	-39.135%	-16.262%
YORW - EPS	11.869%	6.091%	6.265%
Average	-6.295%	-2.726%	-0.136%
Median	2.287%	6.091%	2.790%
ARTN B - DPS	4.006%	3.478%	7.554%
CTWS - DPS	1.420%	1.220%	1.244%
MSEX - DPS	2.026%	1.902%	2.179%
PNNW - DPS	-6.714%	-1.977%	3.844%
YORW - DPS	6.266%	5.354%	-
Average	1.401%	1.995%	3.705%
Median	2.026%	1.902%	3.012%
ARTN B - BVPS	-0.329%	5.552%	3.812%
CTWS - BVPS	4.135%	5.525%	-17.367%
MSEX - BVPS	5.880%	4.620%	9.671%
PNNW - BVPS	-0.847%	0.331%	2.502%
YORW - BVPS	7.677%	6.223%	5.509%
Average	3.303%	4.450%	0.825%
Median	4.135%	5.525%	3.812%

Large Water Company

Growth Rates	3 Year	5 Year	10 Year
AWR - Sales	4.128%	5.126%	6.168%
WTR - Sales	15.546%	12.511%	15.553%
CWT - Sales	6.818%	5.551%	6.867%
SIJW - Sales	7.334%	7.898%	6.342%
Average	8.457%	7.772%	8.732%
Median	7.076%	6.725%	6.604%
AWR - EPS	5.422%	4.301%	4.405%
WTR - EPS	-2.919%	1.895%	3.264%
CWT - EPS	5.553%	2.331%	2.353%
SIJW - EPS	15.523%	15.518%	7.328%
Average	5.895%	6.011%	4.337%
Median	5.487%	3.316%	3.835%
AWR - DPS	1.059%	0.991%	1.100%
WTR - DPS	-3.352%	0.750%	0.023%
CWT - DPS	0.592%	0.717%	1.118%
SIJW - DPS	4.833%	5.297%	3.659%
Average	0.783%	1.939%	1.475%
Median	0.825%	0.870%	1.109%
AWR - BVPS	3.743%	4.276%	4.288%
WTR - BVPS	13.715%	9.643%	3.657%
CWT - BVPS	6.781%	4.039%	3.151%
SIJW - BVPS	7.006%	5.438%	6.314%
Average	7.811%	5.849%	4.352%
Median	6.893%	4.857%	3.973%

Mean (of Means)	1.0%	2.3%	2.6%
Mean (of Medians)	3.7%	5.0%	4.2%

Average	3.1%
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Mean (of Means)	5.7%	5.4%	4.7%
Mean (of Medians)	5.1%	3.9%	3.9%

Average	4.8%
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Data Source: Bloomberg

Exhibit_(JRW-7)

Tega Cay Water Service, Inc.
DCF Equity Cost Growth Rate Measures
Value Line Historic and Projected Rates

Small Water Company Group

Company	Value Line Historic Growth			Past 1 Year		
	Past 5 Years			Earnings	Dividends	Book Value
	Earnings	Dividends	Book Value			
Artesian Resources Corp.						
Connecticut Water Services, Inc.	0.5%	1.0%	5.0%	-24.0%	1.0%	5.0%
Middlesex Water Company	1.0%	2.0%	3.5%	-2.5%	1.5%	2.5%
Pennichuck Corp.						
York Water Company	NA	-9.5%	NA	15.0%	7.5%	4.0%
Mean	0.8%	-2.2%	4.3%	-3.8%	3.3%	3.8%

Company	Value Line Projected Growth			Value Line Internal Growth		
	Est'd. '01-'03 to '07-'09			Return on Equity	Retention Rate	Internal Growth
	Earnings	Dividends	Book Value			
Artesian Resources Corp.						
Connecticut Water Services, Inc.	NA	NA	NA	7.5%	5.0%	0.4%
Middlesex Water Company	NA	NA	NA	8.2%	6.0%	0.5%
Pennichuck Corp.						
York Water Company	NA	NA	NA	11.6%	24.0%	2.8%
Mean				9.1%	11.7%	1.2%

Large Water Company Group

Company	Value Line Historic Growth			Past 5 Years		
	Past 10 Years			Earnings	Dividends	Book Value
	Earnings	Dividends	Book Value			
American States Water	0.0%	1.0%	4.0%	-1.0%	1.0%	4.5%
Aqua America, Inc.	9.0%	6.0%	9.5%	8.5%	6.5%	11.0%
California Water Service Group	5.0%	1.5%	2.5%	-4.0%	1.0%	1.5%
SJW Corp.	NA	NA	NA	5.5%	5.0%	5.0%
Mean	4.7%	2.8%	5.3%	2.3%	3.4%	5.5%
Average	4.0%					

Company	Value Line Projected Growth			Value Line Internal Growth		
	Est'd. '01-'03 to '07-'09			Return on Equity	Retention Rate	Internal Growth
	Earnings	Dividends	Book Value			
American States Water	8.0%	1.0%	5.0%	9.0%	48.0%	4.3%
Aqua America, Inc.	11.0%	10.0%	8.0%	13.0%	45.0%	5.9%
California Water Service Group	4.5%	1.0%	5.0%	9.0%	33.0%	3.0%
SJW Corp.	NA	NA	NA	10.6%	53.0%	5.6%
Mean	7.8%	4.0%	6.0%	10.4%	44.8%	4.7%
Average	5.9%					

Data Source: Value Line Investment Survey, April 28, 2006.

Exhibit_(JRW-7)

Tega Cay Water Service, Inc.
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Estimates

Small Water Company Group

Company	Yahoo First Call	Reuters	Zack's	Average
Artesian Resources Corp.	11.50%	11.50%	11.50%	11.50%
Connecticut Water Services, Inc.	NA	NA	NA	NA
Middlesex Water Company	3.50%	3.50%	3.50%	3.50%
Pennichuck Corporation	NA	8.00%	8.00%	8.00%
York Water Company	7.80%	7.75%	7.00%	7.52%
Mean	7.60%	7.69%	7.50%	7.63%

Data Sources: www.zacks.com, www.investor.reuters.com,
<http://quote.yahoo.com>, July, 2006.

Large Water Company Group

Company	Yahoo First Call	Reuters	Zack's	Average
American States Water	4.50%	2.00%	6.00%	4.17%
Aqua America, Inc.	10.00%	9.83%	8.80%	9.54%
California Water Service Group	8.00%	9.00%	9.00%	8.67%
SJW Corp.	NA	NA	NA	NA
Mean	7.50%	6.94%	7.93%	7.46%

Data Sources: www.zacks.com, www.investor.reuters.com,
<http://quote.yahoo.com>, July, 2006.

Tega Cay Water Service, Inc.
Capital Asset Pricing Model

Small Water Company Group

Risk-Free Interest Rate	5.25%
Beta*	0.67
<u>Ex Ante Equity Risk Premium**</u>	<u>4.15%</u>
CAPM Cost of Equity	8.0%

Large Water Company Group

Risk-Free Interest Rate	5.25%
Beta*	0.74
<u>Ex Ante Equity Risk Premium**</u>	<u>4.15%</u>
CAPM Cost of Equity	8.3%

* See page 2 of Exhibit_(JRW-8)

** See page 3 of Exhibit_(JRW-8)

Exhibit_(JRW-8)

Tega Cay Water Service, Inc.

Beta

Small Water Company Group

Company	Beta
Artesian Resources Corp.	N/A
Connecticut Water Services, Inc.	0.75
Middlesex Water Company	0.75
Pennichuck Corporation	N/A
York Water Company	0.50
Mean	0.67

Large Water Company Group

Company	Beta
American States Water	0.70
Aqua America, Inc.	0.80
California Water Service Group	0.75
SJW Corp.	0.70
Mean	0.74

Data Source: *Value Line Investment Survey, April 28, 2006.*

Tega Cay Water Service, Inc.
Capital Asset Pricing Model
Equity Risk Premium

Category	Study Authors	Range		Mean of Range	Mean	Category Average
		Low	High			
Historic	Ibbotson			6.50%	5.70%	
		Arithmetic				
		Geometric		4.90%		
	AVERAGE					5.70%
Puzzle Research	Claus Thomas				3.00%	
	Arnott and Bernstein				2.40%	
	Constantinides				6.90%	
	Cornell	3.50%	7.00%	5.25%		
	Dimson, Marsh, and Staunton	Arithmetic	2.50%	4.00%	3.81%	4.35%
		Geometric	3.50%	5.25%		
	Fama French		2.55%	4.32%		3.44%
	Harris & Marston				7.14%	
	Siegel	Geometric			2.50%	
	AVERAGE					4.25%
Surveys	Survey of Financial Forecasters				2.00%	
	Graham and Harvey - CFOs				3.80%	
	Welch - Academics	5.00%	5.50%		5.25%	
	AVERAGE					3.68%
Social Security	Office of Chief Actuary	4.00%	4.70%			
	John Campbell	2.00%	3.50%			
	Peter Diamond	3.00%	4.80%			
	John Shoven	3.00%	3.50%		3.56%	
	AVERAGE					3.56%
Building Block	Ibbotson and Peng					
		Arithmetic		6.00%	5.00%	
		Geometric		4.00%		
	Woolridge				2.87%	
	AVERAGE					3.94%
Other Studies	McKinsey	3.50%	4.00%		3.75%	
	AVERAGE					3.75%
OVERALL AVERAGE						4.15%

Sources:

Ibbotson Associates, SBBI Yearbook, 2006.

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**Survey of Professional Forecasters
Philadelphia Federal Reserve Bank
Long-Term Forecasts**

TABLE FIVE
LONG-TERM (10 YEAR) FORECASTS

SERIES: CPI INFLATION RATE		SERIES: REAL GDP GROWTH RATE	
STATISTIC		STATISTIC	
MINIMUM	1.750	MINIMUM	2.500
LOWER QUARTILE	2.300	LOWER QUARTILE	3.000
MEDIAN	2.500	MEDIAN	3.200
UPPER QUARTILE	2.725	UPPER QUARTILE	3.400
MAXIMUM	3.700	MAXIMUM	4.250
MEAN	2.512	MEAN	3.189
STD. DEV.	0.354	STD. DEV.	0.301
N	49	N	49
MISSING	4	MISSING	4
SERIES: PRODUCTIVITY GROWTH		SERIES: STOCK RETURNS (S&P 500)	
STATISTIC		STATISTIC	
MINIMUM	1.600	MINIMUM	5.000
LOWER QUARTILE	2.170	LOWER QUARTILE	6.000
MEDIAN	2.437	MEDIAN	7.000
UPPER QUARTILE	2.600	UPPER QUARTILE	8.000
MAXIMUM	3.500	MAXIMUM	15.000
MEAN	2.404	MEAN	7.340
STD. DEV.	0.355	STD. DEV.	1.800
N	46	N	41
MISSING	7	MISSING	12
SERIES: BOND RETURNS (10-YEAR)		SERIES: BILL RETURNS (3-MONTH)	
STATISTIC		STATISTIC	
MINIMUM	4.000	MINIMUM	2.800
LOWER QUARTILE	4.842	LOWER QUARTILE	3.985
MEDIAN	5.000	MEDIAN	4.250
UPPER QUARTILE	5.500	UPPER QUARTILE	4.575
MAXIMUM	7.200	MAXIMUM	5.500
MEAN	5.146	MEAN	4.200
STD. DEV.	0.579	STD. DEV.	0.631
N	44	N	44
MISSING	9	MISSING	9

Source: Philadelphia Federal Reserve Bank, Survey of Professional Forecasters, February 13, 2006.
<http://www.phil.frb.org/files/spf/spfq106.pdf>

Tega Cay Water Service, Inc.
CAPM
Real S&P 500 EPS Growth Rate

Year	S&P 500 EPS	Annual Inflation CPI	Inflation Adjustment Factor	Real S&P 500 EPS	
1960	3.10	1.4		3.10	
1961	3.37	0.7	1.0070	3.35	
1962	3.67	1.3	1.0201	3.59	
1963	4.13	1.6	1.0364	3.99	
1964	4.76	1	1.0468	4.55	
1965	5.30	1.9	1.0667	4.97	
1966	5.41	3.5	1.1040	4.90	
1967	5.46	3	1.1371	4.80	
1968	5.72	4.7	1.1906	4.81	
1969	6.10	6.2	1.2644	4.83	
1970	5.51	5.6	1.3352	4.13	10-Year
1971	5.57	3.3	1.3792	4.04	2.9%
1972	6.17	3.4	1.4261	4.33	
1973	7.96	8.7	1.5502	5.13	
1974	9.35	12.3	1.7409	5.37	
1975	7.71	6.9	1.8610	4.14	
1976	9.75	4.9	1.9522	4.99	
1977	10.87	6.7	2.0830	5.22	
1978	11.64	9	2.2705	5.13	
1979	14.55	13.3	2.5724	5.66	10-Year
1980	14.99	12.5	2.8940	5.18	2.3%
1981	15.18	8.9	3.1516	4.82	
1982	13.82	3.8	3.2713	4.23	
1983	13.29	3.8	3.3956	3.91	
1984	16.84	3.9	3.5281	4.77	
1985	15.68	3.8	3.6621	4.28	
1986	14.43	1.1	3.7024	3.90	
1987	16.04	4.4	3.8653	4.15	
1988	22.77	4.4	4.0354	5.64	
1989	24.03	4.6	4.2210	5.69	10-Year
1990	21.73	6.1	4.4785	4.85	-0.7%
1991	19.10	3.1	4.6173	4.14	
1992	18.13	2.9	4.7512	3.81	
1993	19.82	2.7	4.8795	4.06	
1994	27.05	2.7	5.0113	5.40	
1995	35.35	2.5	5.1365	6.88	
1996	35.78	3.3	5.3061	6.74	
1997	39.56	1.7	5.3963	7.33	
1998	38.23	1.6	5.4826	6.97	
1999	45.17	2.7	5.6306	8.02	10-Year
2000	52.00	3.4	5.8221	8.93	6.3%
2001	44.23	1.6	5.9152	7.48	
2002	47.24	2.4	6.0572	7.80	
2003	54.15	1.9	6.1723	8.77	
2004	67.01	3.3	6.3735	10.51	
2005	68.32	3.5	6.5978	10.35	
Data Source: http://pages.stern.nyu.edu/~adamodar/				Real EPS Growth	2.71%

Exhibit_(JRW-9)

Tega Cay Water Service, Inc.
Value Line Projected Return Study

	Value Line Projected Four-Year Return	S&P 500 Actual One-Year Return	S&P 500 Actual Four-Year Return	Value Line - S&P 500 Four-Year Return
1984	23.30%	6.27%	14.99%	8.31%
1985	20.03%	31.73%	17.69%	2.34%
1986	14.38%	18.67%	17.68%	-3.30%
1987	14.68%	5.25%	11.87%	2.82%
1988	18.67%	16.61%	18.04%	0.63%
1989	16.80%	31.69%	15.69%	1.11%
1990	20.88%	-3.11%	10.62%	10.26%
1991	19.00%	30.47%	11.87%	7.13%
1992	17.70%	7.62%	13.36%	4.34%
1993	14.96%	10.08%	17.20%	-2.24%
1994	15.61%	1.32%	22.96%	-7.35%
1995	15.14%	37.58%	30.51%	-15.37%
1996	13.19%	22.96%	26.39%	-13.20%
1997	13.20%	33.36%	17.20%	-4.00%
1998	9.91%	28.58%	5.66%	4.24%
1999	14.23%	21.04%	-6.78%	21.01%
2000	18.57%	-9.11%	-5.34%	23.91%
2001	17.20%	-11.88%	-0.52%	17.72%
2002		-22.10%		
2003		28.70%		
2004		10.87%		

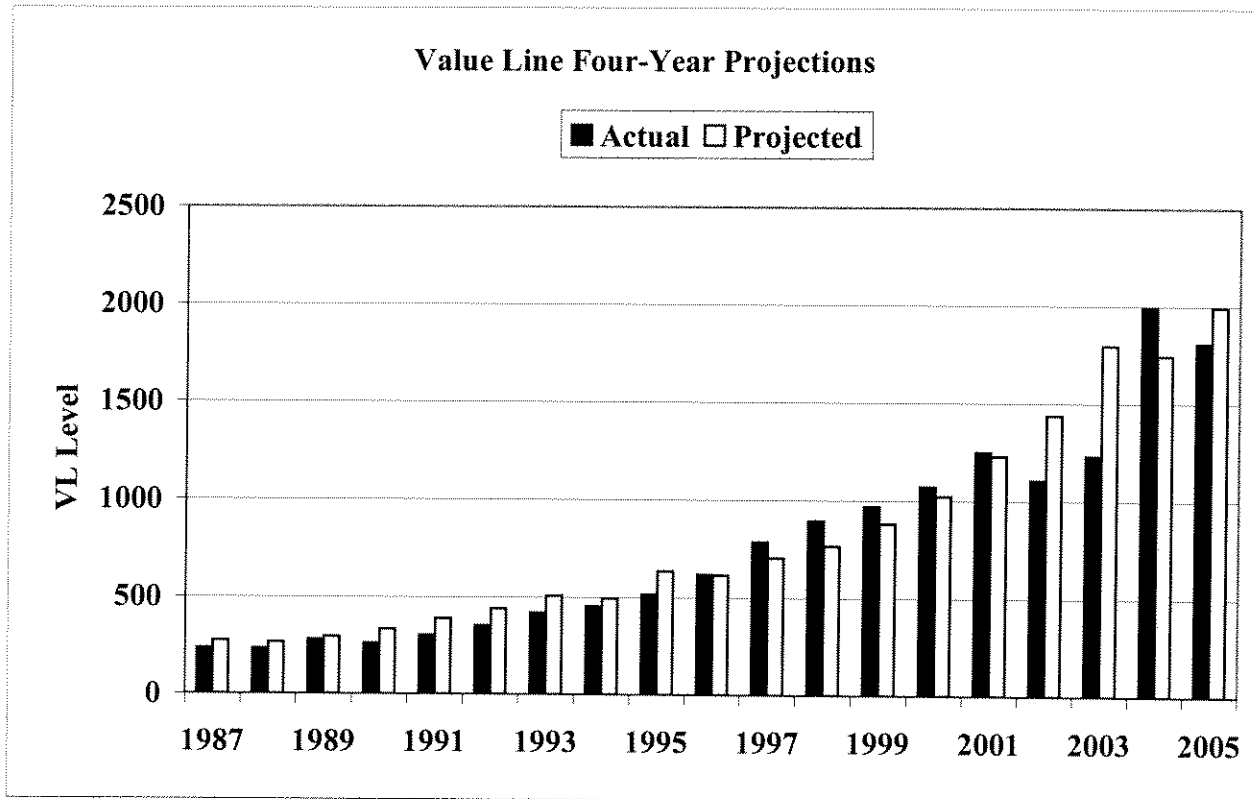
Average Projected - Actual Return

3.24%

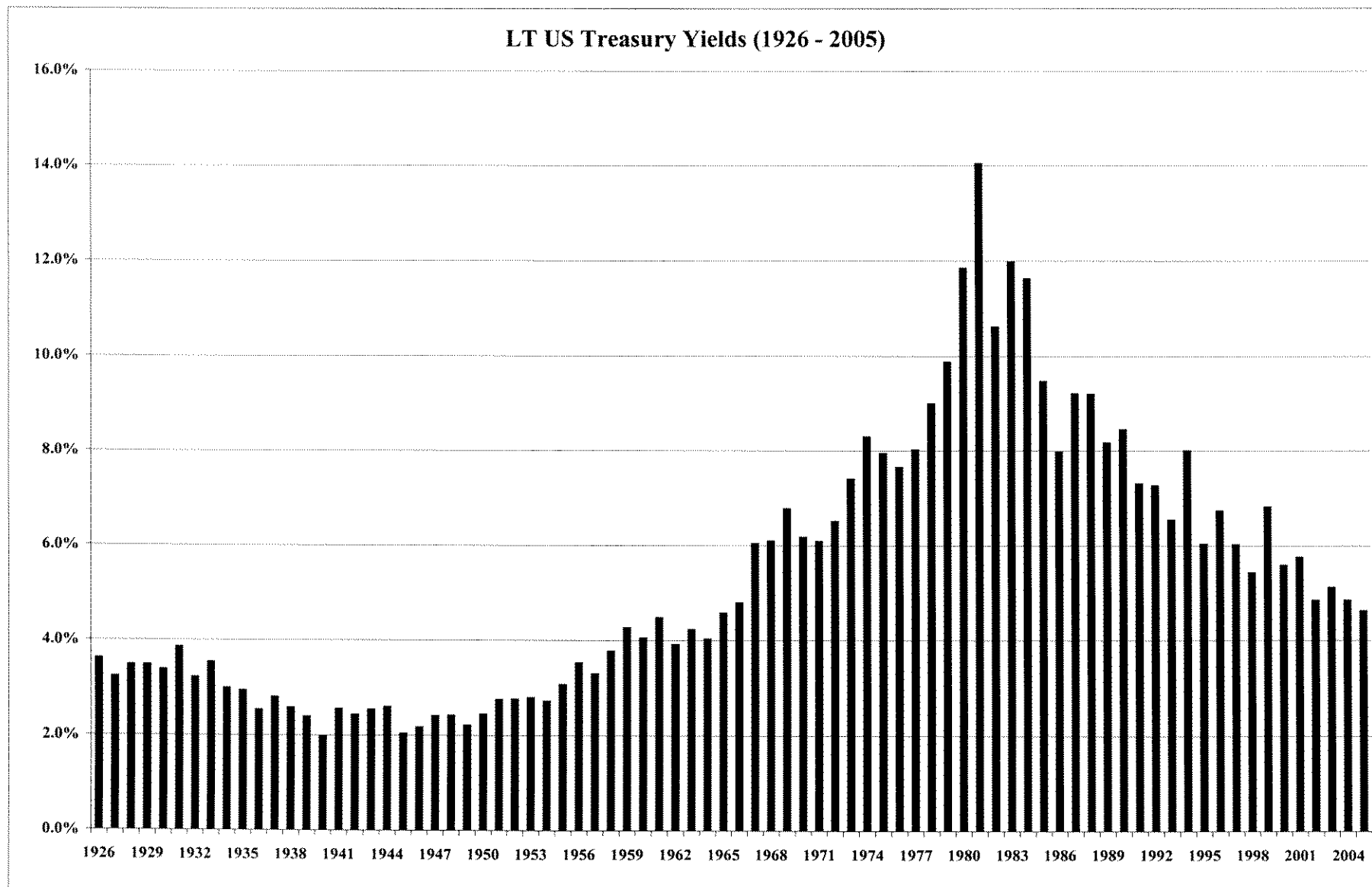
Data Source: *Value Line Investment Survey*, various issues.

Exhibit_(JRW-9)

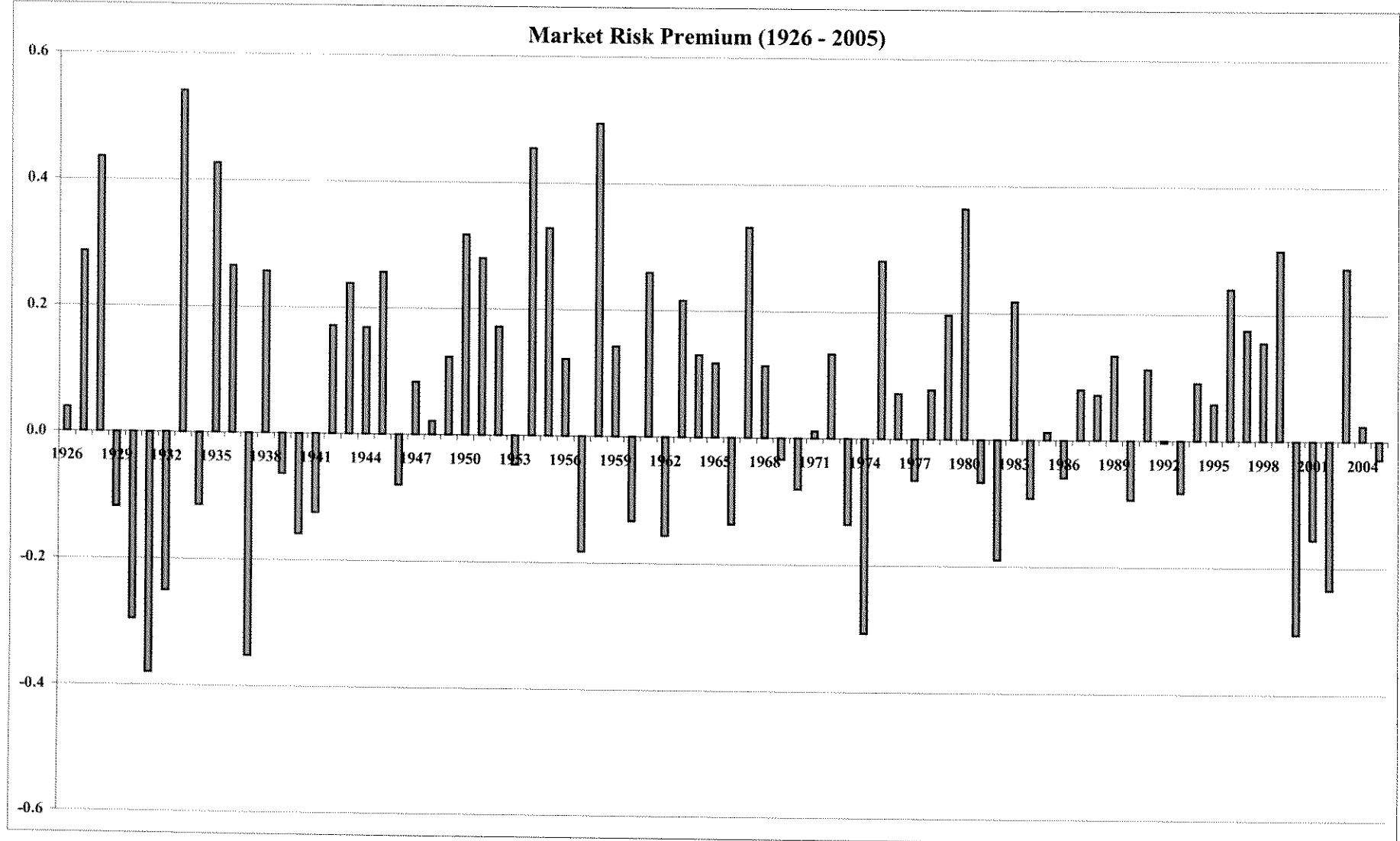
Tega Cay Water Service, Inc.
Value Line Projected Four-year Returns



Data Source: *Value Line website*.



Data Source: Ibbotson Associates, SBBI Yearbook, 2006.



Data Source: Ibbotson Associates, SBBI Yearbook, 2006.

